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Original Communications.

*REST IN THE TREATMENT OF DISEASE.**

By H. C. Wood, M.D., LL.D.†

THE object of the present lecture is to give you such ideas of the endeavors of the physician in the application of rest to the treatment of disease that you may intelligently co-operate with the doctor in charge of the case. You will remember, I trust, from your early childhood's teaching, that when Adam fell it was announced that by the sweat of man's brow he should earn his daily bread. In these later days we have changed all that, and a great many of the higher portion of man earn their daily bread not by the sweat of the brow but by the toil of the brain. In early childhood, when the little atom of humanity should be out in God's sunlight, he or she is put in school in cramped quarters, leaning over desks and learning lessons, struggling with toil and weariness to develop the brain and nervous system at the expense of the physical powers, if thereby in the future he may climb over some other little atom, who, like himself, has been sacrificed to the

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Moloch of culture. As we grow in age this toil ever increases, until at last, when early manhood, or, perhaps, early womanhood, is reached, life is one perpetual nerve-strain. Many years ago, when old Professor Jackson, himself an example of this ruin which is wrought by overstrain, used to lecture to us at the University of Pennsylvania, he taught us this invaluable lesson, that every human being has a certain amount of nerve-force, which is produced by his system daily, and that if more nerve-force than the daily product be used, there will be a continual drawing on the reserve power, until there comes a time when nervous bankruptcy results. It is precisely the same as when a man with a fixed income lives on through the years, spending each year only a little, it may be, more than his income, but, as this continues, at last the capital begins to feel the drain, and, with an accelerated pace, ruin comes on.

Few of us, I think, clearly understand how much of nerve-force it requires simply to live. Remember that the heart beats seventy to eighty times a minute. These great strokes of the central pump must go on through night and day in order that the blood may freely flow through the system. The great tides of air must be drawn in and forced out of the lungs continually, at the expenditure of an enormous amount of nerve-force. When digestion is to be performed, it must be at the expenditure of nerve-force. Most of you have learned from experience this fact, that when you are over-tired a meal will not be digested, which, at other times, you would be able to appropriate without trouble. Many years ago, when a boy, I walked across Chester County from Maryland to the Chester Valley. I had nothing to eat all day, and at night, when we came to a farmer's, he loaded his board down with heavy short-cake. Now, short-cake is a substance that yields only to the digestion of untired boys and ostriches. All through that night and for several weeks afterwards I wished that I had never been born. I had so exhausted myself that there was left no nerve-power to digest this unreasonable food, and, as a result, it underwent fermentation, and poisoning occurred. The heart must act and air must be breathed, but digestion is not absolutely essential, and, consequently, when a man or woman becomes over-exhausted, digestion suffers and no food is taken. When power is failing and strain is greatest, too little fuel is supplied to meet the demand, and so, little by little, this vicious circle is passed around, until it ends in failure and bankruptcy, which is more and more complete.

Again, often after an acute disease there is left a condition of exhaustion in which the vital powers are not able to supply the needs of every-day life and at the same time accumulate strength. Here, again, rest is necessary.

In health to meet company and associate with our friends adds new life and vigor and power, but the entertainment of people by a woman who is feeble and worn out requires a physical expenditure which is often a great strain. Hence comes the exhaustion of an excessively active social life. Hence it has come that as a central idea of the rest-cure isolation is an important feature. Here there is of course great danger that there shall be rest-cure quacks just as there are quacks with almost every form of special therapeutics. This is a remedial measure which is to be employed with care. It is not a stereotyped and set mould into which every little fragment of exhausted humanity is to be crowded and made to fit whether or not. In some instances it is to be applied with great severity, while in other cases it is only the principles which underlie it that are to be used.

The principle which underlies the rest-cure is, in the first place, the absolute avoidance of all physical expenditure of strength, so that there shall be time for digestion, and so that there shall be opportunity to accumulate the wasted income. One of you lives behind her financial income, and you then go to some hamlet and live in a corner until the income thus saved adds to the capital, and the fortune is restored. This is precisely what the doctor attempts to do when he applies the rest-cure. He puts the patients to bed, keeps them quiet, and does everything to avoid the expenditure of a single unnecessary grain of vital force. He takes that little grain of nerve-energy and uses it to digest a little particle of food, and thereby adds to the exhausted power. It is a very common thing in hungerless patients, put to bed under proper surroundings and kept quiet, to see the appetite return at once. Under these circumstances the appetite is the measure of the deficiency or of the surplus of nerve-power. If there be too little power for nerve-digestion there will be no appetite. When there is a husbanding of the resources the appetite returns.

If a patient is put to bed and allowed to lie there perfectly quiet, then his muscular system is in much the same condition as is that of

the fakir's arm. He ties up his arm, and keeps it so through the decades, and as a result there is a withered, structureless mass without power, the muscular fibre absolutely gone out of it. It is in the muscles of the human being and of the animal that the animal heat is chiefly produced. It is chiefly in the muscular system that are burnt up the effete substances that are the waste of the body, so when the muscles waste the animal heat fails, and the power to destroy effete matters fails. If, then, a patient is put to bed and kept perfectly quiet, there is lack of oxygenation of the tissues, and a gradual loss rather than a gain of power. The importance of rest in the treatment of disease has been long recognized, but it is to the sagacity of Dr. S. Weir Mitchell that we are indebted for the comprehension of the fact that we must not only try to conserve nerve-power, but to also supply power by maintaining the activity of the muscles in such a way that there shall be no draught upon the nerve-centres. If I move my arm there is an impulse flows out from the brain, and, by virtue of this expenditure, the arm is moved. If, however, I apply electrical stimulation, the muscle contracts, the structure of the muscle is maintained, and the activity of the muscle in destroying waste matters is kept up, but there is no expenditure of nerve-power.

Again, where there is no contraction of the muscles, there is a tendency to the accumulation of the juices from the blood in what we may call the by-roads of the system. It is not chiefly the blood that is in the vessels that directly nourishes the body, but the juices that have escaped from the blood that nourish the tissues. Along with every blood-vessel there runs a channel through which these juices that are not used are taken up, carried back into the trunk, and returned to the blood. When the muscles are inactive these little channels become choked up. When I forcibly contract my arm all these little channels are squeezed by the muscles, much as you squeeze a sponge when you take it in your hand. The squeezing of the muscles drives the blood on towards the centre of the body, and also causes the return of these juices to the trunk, and finally to the blood. With absolute rest and quiet there is very little return, and the parts become choked with the half-used blood or flesh juices. Electrical stimulation causes contraction of the muscles and aids very much in the return of these juices, but it is chiefly single muscles that we pick out by the electrical current. Therefore, partly for the purpose of aiding in the nutrition of the muscles, and partly for the purpose of returning these juices to the body, we add massage to the electricity. I have gone a little into the details of the principles involved because it not infrequently happens that persons in applying massage make mistakes because they do not appreciate the principles. Sometimes you will see a person rubbing the limb in a downward direction. This is contrary to the direction in which you wish these flesh-juices to go. You do not want to drive them from the arm into the fingers. You want to force them from the extremities to the centre. You continually try to work these juices from the outermost parts and return them to the central portions, where they will soon find their way into the blood.

Under certain circumstances the nurse is called upon to apply electricity. This is always an unfortunate thing, and the treatment sometimes fails on this account, for in using electricity for the purpose of which I am speaking constant judgment is required to know what succession of muscles to cause to contract and also how much of power to employ. It is always much better, where it is possible to do so, to employ some of the younger members of the profession whose time is not as valuable as that of the middle-aged man. I shall not occupy your time with an elaborate discussion of the methods of applying electricity, but shall only call your attention to those parts of the electrical treatment which it is the duty of the nurse to understand. In the first place, it is the duty of the nurse to know how to take care of the battery. There are various forms of faradic batteries, which are the ones employed in this method of treatment, but they all have certain features in common. There is always a cell which contains some acid liquid, into which is plunged a plate of zinc. When the battery is in action the zinc is gradually eaten up by the acid, and the acid is gradually exhausted by the destruction of the zinc, so that the battery destroys itself. The nurse should see that when the battery is not in actual use the zinc is removed from the acid. In the form of battery which I have here the zinc is removed by simply pulling up this rod. In other forms of batteries you have to loosen a screw which holds the zinc, and lift it out and put it into another cup. It is also the duty of the nurse to see that the battery is so kept that there is no spilling of the acid. The nurse should always see that the physician is provided with warm water, in which he can

wet the sponges, and it is well to use a little salt in the water. The water when first brought into the room should be hot, otherwise it may become cold before the séance is over.

With regard to massage, I believe that every thoroughly-instructed nurse should understand it. It, however, cannot be taught by lectures, but must be acquired by personal instruction. I myself know the theory of massage pretty thoroughly, but the practice of it is an entirely different thing. This requires training and the repetition of certain muscular movements until they are done firmly, smoothly, and gracefully. In massage the movements should commence with the fingers. It is well to begin with a rotatory movement in the joints. Then you begin the massage proper. There are three different movements employed,—first, stroking; second, kneading; third, a beating movement, which is made with the fingers acting like so many sticks. The stroking movement is especially directed to driving the juices out of the part operated upon towards the centre of the body. It should be made with the two hands simultaneously. The pressure must be made with the ball of the thumb and the palm of the hand. Before making this movement, if the skin is very susceptible, it should be greased with sweet cocoanut oil, vaseline, or some other unguent. Remember always that this is not rubbing. If you rub a patient, you want to irritate the skin. When you are practising massage you do not want irritation of the skin, but you especially desire to affect the deeper structures. The stroking movement is sometimes made simply with the upward movement of the two hands. It is better to grasp the limb with the one hand above the other. Then you commence the movement with the left hand, and follow it with the right, then slip back with the left hand, while the right keeps up the pressure.

In the kneading movement the effort is made to pick up the individual muscle, and so grasp it between the thumb and forefinger that you roll the muscle on itself. The movement in striking or beating is made with the fingers perfectly loose, and should be made from the wrist and elbow, never from the shoulder. It should be made as rapidly as possible, and carried up the entire limb.

The question of feeding a patient who is undergoing this method of treatment must be decided absolutely by the doctor. It is the nurse's simple business to carry out the directions given by the doctor. The doctor, under these circumstances,—and I think he should do so in the treatment of all diseases,—should make out a written schedule, so that there can be no possible doubt as to the orders. Some years ago I had an important patient suffering with typhoid fever, who, I believe, was killed by a mistake of the nurse. It certainly was a very distinct solace to me that the orders of the nurse were plainly written. It was absolute carelessness on her part. In all cases of disease the orders for the nurse should be written. A schedule should be made out. We may start at eight A.M. with breakfast. At nine o'clock the bath may be given. In giving the bath it is essential that the patient should be absolutely nude, and she should be put between blankets. The water used should be as hot as can be borne. Unless otherwise directed, it is better to add a little hartshorn or ammonia to the water rather than to use soap. From one-half to one ounce of ordinary aquæ ammoniæ may be added to the small bucketful of water. This will leave the skin soft and in better condition than if soap has been freely used. The bath should occupy about thirty minutes. In most cases the patient is much better if rubbed with ice immediately after the bath or during the bath. This is not to be done unless ordered by the physician. If ordered to rub the patient with ice, you do not take a great iceberg, thrust it on the skin of the patient, and then go to sleep. You take a piece of ice and, with an up-and-down motion, rub it over the limb until the whole surface has been covered. Then dry with a coarse towel. You will find that under this treatment the pale, muddy skin rapidly becomes pink. We have no power equal to this use of hot water and ice in drawing the blood to the surface of the body and in stimulating the skin.

At ten o'clock the patient may have massage. At eleven o'clock milk or some food will probably be ordered. At one P.M. dinner will be taken. Medicines, if employed, are to be put in their proper places. At four o'clock electricity may be employed and a glass of milk given. At five o'clock supper will be given. Seven or eight o'clock will be bedtime. Usually the patient is in bed all the time, but I think patients progress more rapidly if they are permitted to be up a portion of the time.

In making the toilet of these patients never allow them to do up their hair. The great mass of hair which many women have is in itself a labor to comb, and the holding up of the arms is especially tiresome, yet fre-

quently this is one of the points on which patients are most stubborn. In a case of strict rest-cure, you must cut up the food of the patient, and see that the patient does not feed himself or herself. These are the cases in which the method is being used in its utmost strictness. If you have not had definite instructions with reference to these points, ask the physician what he wants you to do.

The hours of the day are twenty-four, but when a person is confined to bed they seem to become forty-eight. In this method of treatment there is so much to be done in the way of bathing, massage, and electricity that much of the time is past without the patient knowing it. There are, however, hours for which it is better to provide some amusement for the patient. I think, therefore, that every nurse, or every nurse who hopes to reach the highest point in her profession, should study the art of reading. The matter read is to be selected by the physician. It is very easy for the patient to tyrannize over the nurse who reads to her. A nurse recently told me that she had to read seven hours to the patient. This is tyranny, and it is the business of the physician to protect the nurse as much as it is his business to protect the patient. There is, perhaps, nothing which develops selfishness more rapidly and thoroughly in human nature than does a long period of chronic invalidism.

What I have been saying to you applies especially to the treatment of chronic disease, but it seems to me to be a matter of importance that you should have a clear idea of the application of the same principles to acute diseases. It also seems to me important, in order that you may be *en rapport* with the medical profession, that you should have some understanding of modern therapeutics and ways of treatment. Therefore I shall at this point branch out a little from the discussion of my main subject, coming back to show you how rest comes into the treatment of all diseases. There was a time when medicine was a purely empirical, dogmatic art. There is of necessity still much of dogmatism and empiricism in the practice of medicine,—that is, we are forced to do certain things because experience has taught us that certain things do good,—but every day are we, as scientific physicians, getting the power of treating disease intelligently and rationally. Perhaps the greatest nuisances that the doctor ever encounters are those amateur doctors, usually, I am compelled to say, of your esteemable sex, who think that they know medicine; the amount of their conceit is in direct proportion to the depth of their ignorance. Under these circumstances you will find that the great stronghold out of which no argument will drive these amateur triflers with life is, "I have seen, and therefore I ought to know." Once I was in the smoking-room of a transatlantic steamer, and there was one of these pestilential creatures there, who this time wore a hat. He was continually bothering me with questions as to the why this and that man had been cured by this or that irregular practitioner after regular physicians had failed. Finally, after I had for some time dodged his questions to the best of my ability, a little Frenchman spoke up, and said to the questioner, "Your talk reminds me of a story." He then told the following story, which I regret that I cannot give in his broken English: "Once in a village there was a shoemaker who was very sick of a fever. Some one who was visiting the wife said to her, 'Your husband has been sick for a long time. I can cure him. Give him as much pork and cabbage as he can eat, and he will get well of the fever.' The next day the woman fed her husband on pork and cabbage, and lo and behold, the fever left the man and he recovered. He put down in his note-book, for future reference, 'Pork and cabbage cures fever.' A few days later there was no ring of the anvil in the village smithy. The shoemaker went to inquire what had become of the blacksmith. He was told that he was sick with a fever. At once he said, 'I know what will cure him. Give him pork and cabbage.' The wife administered pork and cabbage, and the blacksmith incontinently died. The shoemaker, on seeing the symbols of death on his neighbor's house, gets down his note-book to see if there has been any mistake. No, there it is, black and white, 'Pork and cabbage cures fever.' Finally, after rubbing his head awhile, he exclaimed, 'I have got it!' and he wrote in his note-book, 'Pork and cabbage cures shoemakers with fever, but it kills blacksmiths.'"

This pork-and-cabbage style of therapeutics was the only method of treatment of disease forty or fifty years ago; but, thanks to the homœopathic physicians, who emboldened the profession to watch the course of disease without treatment, the regular profession learned this important fact, that most acute diseases have in themselves a tendency to recover. It is the physician's duty to study the dangers which attend the disease and the methods which nature takes to bring about recovery. He should also study the drugs which he has

at his command, and by inductive reasoning apply his knowledge of drugs to his knowledge of the dangers of the disease. To make this clear, let me take you out on the broad Atlantic, where the sunlight is thrown back from every wave as the steamer ploughs the furrows that unite two continents. The captain notes that the mercury is falling. The mate sees a little cloud gathering in the west. To-morrow the hurricane will be upon the vessel. The captain cannot put back the hurricane, but he can make everything snug and tight about the vessel, and he can so turn the helm that the ship goes before the wind. He knows the dangers and avoids them. He goes with the tempest, and does not try to oppose it. This is generally the position of the physician in a case of acute disease. We cannot cure typhoid fever, but we can, if we study typhoid fever properly, carry the ship right on through the tempest and bring it into quiet waters.

The first thing that we learn in studying typhoid fever is, that in the majority of instances it causes death by producing exhaustion. We learn also that sometimes it kills by producing disease of the bowel with ulceration, and that a little particle of solid food getting upon one of these ulcers may tear open the bowel with fatal results. We study the dangers, and see how they are to be avoided. Of all the dangers in typhoid fever exhaustion is the most serious. The successful treatment of typhoid fever rests not upon the administration of drugs, although this may be important, not upon the meeting of this and that symptom as it arises, although the skilful physician does that, but it rests especially upon the fact that the disease has been recognized early, and that every grain of strength has been husbanded, so that in the coming weeks, when it shall be needed, it shall be present. I have often compared a patient with typhoid fever to a ship on a coast in a storm. The ship is being driven on to the point of rocks, but beyond the jutting promontory is smooth water and safety. If the captain can carry the ship around that jutting rock, it makes no difference how close he may come to it, if he but clears it, he is safe. So, in typhoid fever, there often comes a time when it is the last grain of strength that holds the man as he crosses by the edge of the open grave. If you can hold him for a few hours, until a little strength is gained, he is safe. The grain of strength which you as a nurse wasted by allowing the patient to get out of bed three weeks before, may be the grain of strength which might have carried the man through. In every case of such disease it behooves you to remember that every particle of strength that you can save is perhaps life to that patient. The moment that there comes the slightest indication of the approaching storm the patient should be put to bed, kept quiet, and not allowed to make any motion or exertion. Many a doctor orders absolute rest, and the nurse perhaps thinks that she is carrying out her instructions, and the patient dies because the doctor is careless and the nurse is ignorant. Under these circumstances absolute rest means absolute rest. It means that the patient shall be put in bed, and not allowed to get out for anything. The patient may feel fairly strong, and will insist that he can get out of bed for the natural acts of the body. The patient is to be kept in bed, and under no circumstances, as you value your professional honor, do you let him rise. If the house is on fire, throw him over your shoulder and carry him out, but do not allow him to rise by himself.

Never allow these patients to make their own toilet. If a bath is ordered by the physician which apparently involves a waste of strength, see to it that it is your strength and not the patient's that is wasted. Do not let the patient do anything whatsoever. Do not let him make any exertion. The writing of a letter may mean death. A man may write a letter to his wife which is his own death-warrant.

This application of rest in the treatment of disease goes further. In all diseases the powers of the nurse should be directed to the saving of the strength of the patient, and you should remember that there is a mental worry which is more exhausting than physical exertion. Mere uncleanliness, a low voice to a deaf patient, a loud, high-pitched voice to a patient whose hearing is acute, failure to quickly understand the whims and caprices of a sick man or woman, are tormenting things which take away the rest and destroy the life of the patient. We talk about uncleanly nurses, and we all know the type of nurse which was pinned up by Dickens for all ages, as the entomologist pins up the beetle and watches its unclean movements, but the unclean nurse is scarcely as bad as the fussy nurse. In one of the hospitals during the war there was a young soldier who happened to be good-looking and near the door. The majority of amateur nurses that came into the room wanted to do something for him. A young lady came into the room one day and

said, "Can I not do something for you?" "Perhaps," he replied. "Can't I wash your face?" "Yes, if it will give you any pleasure, but you are the thirty-seventh that has done it to-day." A nurse who is continually shifting the blinds, moving about the room when there is no need for it, asking the patient whether he wants this or that, or is excessively active and alert, is a great evil.

Now, nurses of the University Hospital, let me say one more word to you. I think that your calling is one of the highest to which a human being ever devoted herself. You remember that the Bible tells us that "He giveth His beloved sleep;" but sleep is rest. So will you, I trust, comport yourselves that in the future, as you go from house to house, it shall be said of you, "She gave me rest."

THE THERMOGENETIC APPARATUS—ITS RELATION TO ATROPINE.

By Isaac Ott, M.D., and Charles Collmar, M.D., Easton, Pa.

THE phenomena of fever have been divided by Dr. Donald McAllister into thermogenetic, thermotaxic, and thermolytic. We believe the thermogenetic apparatus to be mainly seated in the spinal cord, although it is highly probable that similar centres exist in the brain.

The thermotaxic apparatus located by one of us has its cerebral origin (1) in the tissues about the corpus striatum, (2) Schiff's crying centre, and (3) the anterior end of the thalamus. Its fibres probably decussate about the nib of the calamus, and then run down the lateral columns.*

The existence of the centre about the corpus striatum has been confirmed by the researches of Sachs and Aronsohn,† Girard,‡ and Baginsky.§ They found that electric irritation of the corpus striatum increased the temperature.

Baginsky and Lehmann destroyed the nuclei caudati and found an increase of temperature. It is difficult to state why electric irritation increases temperature if the centre is inhibitory. Usually irritation of an inhibitory centre causes a diminished action of the dependent function.

It is possible, however, that the irritation of the corpus striatum also irritates sensory nerve-fibres, causing an increase of temperature, the usual result, and thus counterbalances the depression of temperature consequent to the irritation of the caudate nuclei.

Our observations on the spinal cord show that it requires but slight injury on the inner side of the lateral columns to allow increased thermogenetic action, as also does a slight puncture at a distance from the cerebral heat centres.

Sachs and Aronsohn found an increase of both the consumption of oxygen and the excretion of carbonic acid after puncturing the tissues about the corpus striatum.

They also found an increased waste of the albumens of the body, and a twenty-five per cent. increase of nitrogen in the urine.

The animals were previously fed on a non-nitrogenous diet.

Girard also confirmed their observations on the urinary nitrogen.

Richet's statements never became more definite than that the anterior part of the brain cortex, when irritated, caused increased temperature, which was calorimetrically determined to be due to increased heat production.

One of us investigated the brain cortex of rabbits with negative results, conclusions which have been confirmed by Sachs and Aronsohn.

The thermolytic apparatus, or heat-dissipating apparatus, consists of the vaso-motor system, sweat-glands, the lungs, and the reflex action of surface sensory nerves on the thermotaxic or inhibitory apparatus, allowing increased or diminished heat production, according to the requirements of surrounding temperature.

In this paper we wish to advance additional evidence of the existence of spinal heat centres.

Atropine has always been of great value to the physiologist in the elucidation of obscure phenomena.

We have used it in a series of experiments to demonstrate its relation to the thermogenetic apparatus, and found that it causes the temperature of animals to rise, the elevation varying from 1½° F. to 6.8° F.

If a cat be bound down in a warm room, the rise of temperature without atropine will be 2.1° F. in one and three-quarter hours. The animal's efforts to release itself keep up an irritation which corresponds with the condition of affairs when experimenting with the drug.

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* *Journal of Nervous Diseases*, 1887.

† *Pflüger's Archiv.*

‡ *Archives de Physiologie Normale et Pathologique*, October, 1886.

§ *Virchow's Archiv*, November, 1886.

We give *in extenso* an experiment on the normal animal.

Cat bound down.

Time. P.M.	Rectal temp.	Air temp.
1.55	101.8°	96°
2.25	102.8°	
2.45	103.1°	
2.55	103.6°	
3.45	103.9°	

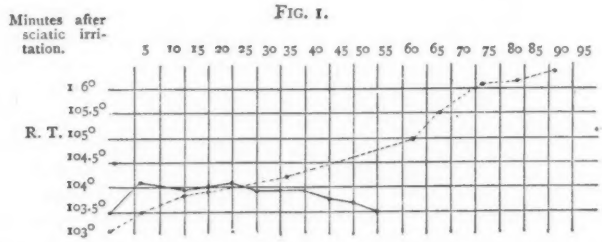
If during the rising temperature caused by atropine the central end of the sciatic be irritated, a greater rise ensues, which is followed or not by a fall, but not below the level of temperature existing before the irritation.

Subsequent irritation of the sciatic in Experiment 3 caused no further rise of temperature.

Fig. 1 shows the effect of sciatic irritation on the normal rabbit and atropinized cat, the continuous line marking the rise and subsequent fall which take place in the non-atropinized rabbit, while the dotted line shows the effect of sciatic irritation on the temperature of an atropinized cat.

In the latter the ascent is not sudden as in the normal line, but is gradual, and continues so without falling. If after administering the atropine the cat be allowed to go about the laboratory there will be a rise of temperature, but not nearly as great as when bound down.

FIG. 1.



In other words, while sciatic irritation in the normal animal, after a preliminary rise, causes a fall of temperature below the normal, atropine prevents a fall below the point attained before the irritation.

It seems that in atropinized cats sciatic irritation is able to cause a great elevation of temperature in a very short time, as in Experiment 3, where the temperature, after a grain and a half of atropine per jugular, sank to 97° F.; from this point on applying sciatic irritation, it rose rapidly to 102° F., a gain of 5° F. in sixteen minutes. (A fair example to show that the gain must be due to increased heat production, as mere diminished dissipation, such as might be caused by vaso-motor contraction, could not occasion such a rise in so short a time.)

The large dose of atropine caused a fall of blood-pressure, and sensory irritation of the sciatic had little effect in increasing the pressure; large doses prevent the sensory irritation from stirring up the vaso-motor apparatus.

Further, in the normal animal, where sciatic irritation causes increased arterial tension, a rise of a degree is about the extent of the effect on the bodily temperature, showing that under atropine the rise must be due to something more than diminished heat dissipation from increased arterial tension.

From this we conclude that the thongs which bind it down act as an irritant similar to the electric irritation of the sciatic. After a dose of atropine the maximum temperature is reached usually at the end of about two hours. Furthermore, the experiments of Von Bezold and Bloebaum show that small doses of atropine elevate the arterial tension and then depress it. Thus we have as a concomitant of a continuously rising temperature, at first a rise of blood-pressure followed by a fall below the normal.

Thus, in Fig. 2, the upper line shows the increasing temperature and the lower line the falling arterial tension.

Ordinarily the increased arterial tension would cause diminished heat dissipation, but our calorimeter experiments demonstrate that during the action of atropine the heat dissipation is increased as well as the heat production.

Hence we infer that circulatory changes have little to do with the rise of temperature under atropine. Atropine also greatly accelerates respiratory movements, but in doing so it makes them more superficial, while in the normal animal bound down the respiration is also much accelerated.

We believe that the rapid respiration also has little effect on the temperature.

If the rise of temperature is due neither to

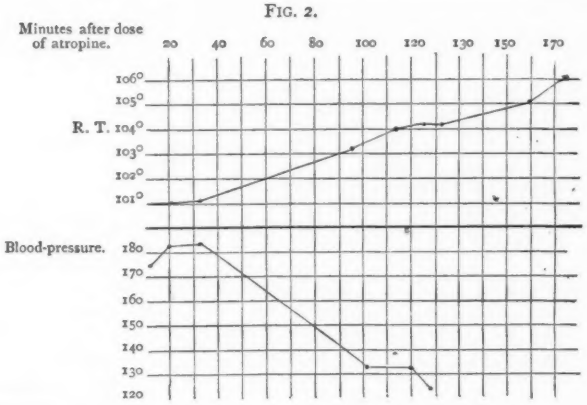
circulatory nor respiratory changes, the cause must be seated either in the muscular or nervous system.

As atropine in small doses does not cause convulsions in warm-blooded animals, the source of increased temperature is not in the muscles, with atropine sphincter rhythm appears. Here it must either paralyze the thalamal inhibitory centres, or excite the spinal centres sufficiently to overcome the inhibition, or act on both at the same time so as to weaken the former and excite the latter.

That it is dependent on the nervous system is proved by the experiment where the animal was curarized, atropine given, the sciatic irritated, and the surrounding temperature high, yet a rise of temperature ensued. It has also been shown by one of us that at the base of the thalami and the head of the crura cerebri are centres which inhibit the sphincters. When these centres are destroyed a rhythm of the sphincters ensues. Now, if a cat receives a large dose of atropine, irritation of the vagina calls out a rhythm of the sphincter, although the sciatic at the time is strongly stimulated. Usually strong sciatic irritation causes an arrest of the rhythm. Now, this experiment proves that atropine either so excites the excito-motor apparatus of the spinal cord as to overcome the thalamal centres, or it weakens the inhibitory centres of the thalami and in this way starts the rhythm. The sudden starts of the animal upon a noise being made would lend support to the view that the inhibitory centres are weakened. The well-known action of atropine upon the inhibitory apparatus of the heart and intestine also makes us believe the inhibitory centres are weakened at the time the spinal reflex centres are excited. As it is well known that atropine is a great stimulant of the spinal cord, evidence in this direction is superfluous.

We believe the increase of temperature to be due to an excitation of the spinal heat centres, and that the irritation of the central end of the sciatic is not able to overcome the spinal stimulation, but rather excites them still more, because the inhibitory centres usually called into activity by sciatic irritation are less active under the drug. This view of the stimulation of the spinal heat centres by atropine is still further strengthened by calorimetric investigations.

FIG. 2.



Both cats and rabbits were placed in D'Arsonval's calorimeter, which is surrounded by felt, feathers, and saw-dust. The temperature of the surrounding air was kept as near as possible within a degree of that of the calorimeter. The sensibility to external heat of our apparatus is .025° F. for each degree the calorimeter is below that of the surrounding air, thus giving accurate results.

Experiment 1.—Cat.

Time. P.M.	Cal. temp.	Rec. temp.
1.51	81.2°	100.8°
2.51	82.2°	100.5°
3.07	injection of $\frac{1}{30}$ grain of atropine by the jugular.	
3.19	82.3°	101.5°
4.19	83.3°	102.0°

Heat dissipation before drug..... 41.72
Heat dissipation after drug..... 41.72
Heat production before drug..... 40.68
Heat production after drug..... 43.64

Experiment 2.—Rabbit.

Time. P.M.	Cal. temp.	Rec. temp.
2.12	86.875°	104.0°
3.12	87.675°	103.5°
3.20	Injection of $\frac{1}{40}$ grain of atropine by the jugular.	
3.42	87.925°	103.9°
4.42	88.7°	105.0°

Heat dissipation before drug..... 34.21
Heat dissipation after drug..... 32.33
Heat production before drug..... 32.82
Heat production after drug..... 35.40

Experiment 3.—Rabbit.

Time.	A. T.	C. T.	E. T.	R. T.
A.M.				
9.33	80.3°	80.1°	27.6°	103.3°
10.33	81.3°	80.475°	27.8°	102.7°
10.50	$\frac{1}{10}$ of a grain of atropine by the jugular.			
11.10	83.1°	80.55°	28.8°	102.7°
12.10	84.0°	81.0°	28.7°	104.6°

Heat dissipation before drug..... 15.64
Heat dissipation after drug..... 18.77
Heat production before drug..... 17.33
Heat production after drug..... 21.75

Experiment 4.—Cat.

Time.	Cal. temp.	Rec. temp.
P.M.		
2.09	80.49°	101.0°
3.09	81.25°	101.2°
3.12	Injection of $\frac{1}{10}$ grain of atropine by the jugular.	
3.31	81.35°	101.9°
4.31	82.25°	102.3°

Heat dissipation before drug..... 31.70
Heat dissipation after drug..... 37.54
Heat production before drug..... 31.04
Heat production after drug..... 38.86

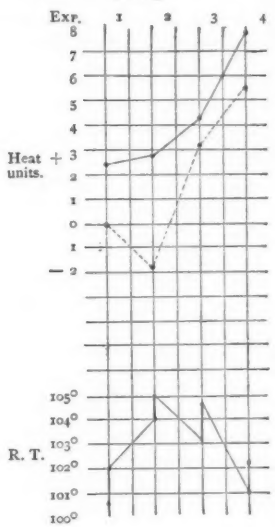
	Increase of heat production.	Increase and decrease of heat dissipation.
1.....	+ 2.58°	0.°
2.....	+ 2.96°	— 1.88°
3.....	+ 4.42°	+ 3.13°
4.....	+ 7.82°	+ 5.84°

It will be seen by the above table and the curves in Fig. 3, the dotted line showing heat *dissipation* and the continuous line heat *production*, that both heat production and heat dissipation are increased, the production more than the dissipation. Hence we believe that atropine increases the temperature by stimulating the thermogenetic centres seated in the spinal cord.

Pathological facts also support this view of the existence of a spinal and cerebral heat apparatus independent of circulatory influence.

Thus, of tetanus, Dr. C. B. Radcliffe* writes, "It is more than difficult to connect the increased heat of tetanus with increased activity of the circulation, or with anything else like fever in the ordinary sense of the word. The temperature rises as the time of death approaches, when the state of the circulation must every moment be becoming more and more the reverse of increased activity. The temperature continues to rise even after actual death, when the blood has come to a stand-still. These are the facts, and these being the facts it may be that the increased heat of tetanus may be connected not with increased activity of the circulation, not with true fever, but rather with the contrary state of things.

FIG. 3.



"Nor is it more easy to connect the increased heat of tetanus with the spasms. A part of the increase may be accounted for in this manner, but only a small part. Indeed, the simple fact that in one of the cases which has been instanced a marked abatement in the severity of the spasms was accompanied by an actual rise in the column of mercury, and that the column continued to rise after death, when all spasm is at an end, is in itself a sufficient proof that it is not in muscular action that the explanation of the increased temperature of tetanus is found.

"Moreover, the fact that the temperature rises in the same way before and after death in cases where neither convulsions nor spasms were among the symptoms during life, must lead to the same conclusion."

Dr. Radcliffe's deductions on the temperature of tetanus and the post-mortem rise are entirely compatible with their explanation derived from later knowledge of the heat apparatus,—that is, the cerebral inhibitory centres are paralyzed, and thus permit the spinal thermogenetic centres to assume unchecked activity. In other words, the spinal heat centres behave just as they do after section of the

* Reynolds's "System of Medicine."

lateral columns of the spinal cord, and allow a great increase of activity in them, which causes the increased temperature.

In the light of our researches there is at present no other rational explanation of these facts. Hence our conclusion that atropine causes an increase of temperature by stimulating the thermogenetic centres in the spinal cord, which produces increased chemical activity in the tissues.

Experiment 1.—Etherized cat; bound down.

Time. A.M.	Rec. temp.	Air temp.	Blood-pressure, millimetres.
11.00	101.4°	90°	
11.05	Injection $\frac{1}{30}$ grain of atropine.		
11.15	101.4°	90°	
11.20	101.6°		
11.45	102.4°	90°	
12.05	103.2°	90°	
12.10	Irritation of sciatic by DuBois coil.		
12.12	103.5°		
12.14	103.8°		
12.18	103.9°		
12.37	104.4°		
P.M.			
1.00	105.0°		
1.05	105.5°		
1.15	106.2°	90°	
1.22	106.3°		
1.30	106.4°	Sciatic irritation.	
1.40	106.6°		
1.50	106.6°	90°	165
2.15	106.3°		
2.42	104.2°		

Experiment 2.—Cat; bound down; etherized.

Time. P.M.	Rec. Temp.	Blood-pressure.
2.30	101.2°	
2.50	.....	165
3.29	Central end of sciatic irritated.	204
3.25	101.0° Injection by jugular of $\frac{1}{2}$ grain of atropine.	
3.30	101.8°	98
3.31	Irritation of central end of sciatic.	
3.32	.....	100
3.40	101.5°	
3.50	$\frac{1}{2}$ grain of atropine by jugular.	
4.00	101.2° Injection of $\frac{1}{2}$ grain atropine.	
4.01	Injection of $\frac{1}{2}$ grain of atropine.	
4.08	.....	64
4.09	Irritation of central end of sciatic.	
4.10	.....	64
5.04	98.0° Sciatic irritated.	
5 05	97.4°	
5.15	97.2°	
5.21	97.0°	

Experiment 3.—Cat; bound down; etherized.

Time. P.M.	Rec. Temp.
2.00	101.5°
2.10	$\frac{1}{3}$ grain of atropine by the jugular.
3.10	99.9° $\frac{1}{6}$ grain of atropine.
4.30	1 grain of atropine.
4.40	99.9°
4.41	Irritation of sciatic begun.
4.42	100.2°
4.45	Irritation of sciatic arrested.
4.47	100.1°
4.53	Sciatic irritated five minutes.
4.58	100.2°
4.59	100.3°
5.03	Sciatic irritation for three minutes.
5.05	100.5°
5.09	100.6°
5.11	100.5°
5.14	100.4°
5.30	100.0°
5.42	99.1°

Experiment 4.—Rabbit; etherized.

Time. P.M.	Rec. temp.
1.45	102.8°
2.02	$\frac{1}{20}$ grain of atropine by the jugular.
2.32	101.0°
3.24	101.7°
4.00	102.1°
4.30	102.4°
5.00	102.0°
5.50	103.1°

Experiment 5.—Rabbit; etherized.

Time. P.M.	Rec. temp.
2.48	103.4° $\frac{1}{20}$ grain of atropine hypodermically.
3.24	102.8°
4.00	102.1°
4.30	102.6°
5.00	103.2°
6.00	104.0°

Experiment 6.—Cat; has been previously experimented on; slightly atropinized; not bound down; etherized.

Time. P.M.	Rec. temp.
1.35	103.3°
1.36	$\frac{1}{30}$ grain of atropine by the jugular.
2.16	103.4°
2.55	103.8°
3.35	104.5°

Experiment 7.—Rabbit; not bound down; etherized.

Time. P.M.	Rec. temp.	Air temp.
1.40	103.2°	85°
1.45	$\frac{1}{40}$ grain of atropine by the jugular.	
2.10	103.0°	
2.25	103.6°	85°
2.45	104.2°	
3.05	104.4°	
3.25	104.7°	
4.00	104.6°	
4.30	104.2°	80°

Experiment 8.—Cat; etherized.

Time.	Rec. temp.	
P.M.		
2.25	101.0°	$\frac{1}{10}$ grain of atropine hypodermically.
3.12	103.8°	
3.42	104.7°	
4.20	103.7°	
5.05	101.8°	

Experiment 9.—Black cat; has been slightly atropinized two days previously; bound down; etherized.

Time.	Rec. temp.	Air temp.
P.M.		
2.10	103.2°	$\frac{1}{10}$ grain of atropine by the jugular.
2.55	104.0°	
3.30	108.0°	93°
4.00	110.0°	Animal has been dead fifteen minutes.

Experiment 10.—Cat; bound down; etherized.

Time.	Rec. temp.
P.M.	
3.45	103.9°
3.50	$\frac{1}{10}$ grain of atropine by the jugular.
4.30	104.4°
5.00	104.5
5.05	Sciatic irritated three minutes.
5.15	105.6°
5.28	105.1°
5.42	105.1°
6.00	104.7°

Experiment 11.—Rabbit; etherized; animal running about the laboratory during the observations.

Time.	Rec. temp.	Air temp.
P.M.		
1.40	103.2°	85°
1.45	$\frac{1}{10}$ grain of atropine sulph. per jugular.	
2.10	103.0°	
2.25	103.6°	85°
2.45	104.2°	
3.05	104.4°	
3.25	104.7°	
4.00	104.6°	
4.30	104.2°	80°

Experiment 12.—Cat; not bound down; etherized.

Time.	Rec. temp.
P.M.	
1.35	103.3°
1.36	$\frac{1}{10}$ grain of atropine sulph. by jugular.
2.16	103.4°
3.55	103.8°
3.35	104.5°
4.00	104.0°

Experiment 13.—Cat; bound down; etherized.

Time.	Rec. temp.	Air temp.
P.M.		
2.30	100.0°	
2.49	$\frac{1}{3}$ grain of atropine by the jugular.	
2.56	98.2°	
3.05	97.6°	
3.25	96.0°	Sciatic's central end irritated with current from DuBois inductorium.
3.35	97.0°	
3.41	102.0°	80°
3.57	97.0°	Central end of sciatic irritated.
4.20	96.0°	

Experiment 14.—Rabbit; bound down; etherized.

Time.	Rec. temp.	Air temp.
P.M.		
1.45	101.4°	94
1.48	Injection per jugular of $\frac{1}{10}$ grain of atropine.	
2.55	102.6°	
2.57	Irritation of central end of sciatic for three minutes.	
3.12	105.0°	
3.15	Irritation of sciatic for three minutes.	
3.23	105.4°	
3.32	105.6°	

Experiment 15.—Rabbit; bound down.

Time.	Rec. temp.	Air temp.
P.M.		
1.20	103.2°	100°
1.21	Irritation of sciatic at sixty millimetres for three minutes.	
1.25	103.6°	
1.30	103.5°	
1.35	103.5°	
1.40	103.5°	
2.23	103.6°	
2.24	103.5°	
2.25	Irritation of sciatic for one minute at 0 of coil.	
2.27	104.3°	
2.33	104.1	
2.38	103.8°	
2.43	104.0°	
2.45	104.1°	
2.53	103.8°	
2.58	103.9°	
3.03	103.9°	
3.07	103.7°	
3.15	103.7°	
3.25	103.7°	
3.27	103.5°	

Experiment 16.—Cat; etherized.

Time.	Pulse.	Pressure.	Rec. temp.
A.M.			
10.15	50	176	101.0°
10.16	Injection of $\frac{1}{10}$ grain of atropine by the jugular.		
10.26	74	184	101.0°
10.30	Injection of $\frac{1}{10}$ grain of atropine by the jugular.		
10.38	70	184	101.3°
11.48	70	132	103.1°
P.M.			
12.05	...	132	104.0°
12.13	...	124	104.3°
12.16	...	.....	105.0°
12.45	...	.....	106.0°

Experiment 17.—Rabbit; received curare subcutaneously; sciatic prepared; animal bound down.

Time.		Rec. temp.	Air temp.
P.M.			
2.40	....	102.9°	96°
2.52	$\frac{1}{10}$ grain of atropine by jugular.		
2.58	.....	102.8°	
3.07	Irritation at 350 millimetres for ten seconds..	102.4°	
3.08	.....	102.5°	
3.12	Irritation at 35 for ten seconds.		
3.18	.....	102.8°	94°
3.25	.....	102.7°	
3.26	Irritation at 35 for fifteen seconds.		
3.44	.....	101.8°	
3.52	.....	101 8°	
4.15	.....	101.4°	92°
4.25	Breathing normally.....	100.6°	

Experiment 18.—Cat; bound down.

Time.		Rec. temp.
A.M.		
11.30	½ grain of atropine by the jugular ...	102.6°
11.40	½ grain of atropine by the jugular. Irritation of sciatic prevents the sphincter rhythm evoked by vaginal irritation.	
11.50	1 grain of atropine.....	103.6°
P.M.		
12.03	With current from DuBois coil at 230 millimetres vaginal irritation occasionally calls out rhythm.	
12.15	Same result as at 12.03 P.M. ½ grain of atropine by the jugular.	
12.22	With strongest sciatic irritation vaginal irritation occasionally calls out rhythm.	
1.05	.....	105.5°

COMPARATIVE EXPERIMENTS BETWEEN THE ACTION OF PAPOID AND PEPSIN.

By Dr. D. Finkler.*

PAPOID is a ferment which is manufactured according to my specification from the plant called *Carica papaia*. It is an albuminous body, which, under certain conditions, can change albumen into peptone. The conditions which produce this change are very different to those under which pepsin and pancreatin produce the same effect.

In order to demonstrate the effect of papoid I shall indicate various experiments made by myself, which will give an exact insight into the conditions of the effect and also a comparison of the effect of pepsin.

For these comparative trials I used a pepsin of known best quality, most of the commercial pepsin being decidedly weaker than that I used.

First question: Has papoid really a digesting property?

Experiment 1.—*a.* 5 grms. raw meat minced, 50 c.c. water, 5 c.c. of a one per cent. papoid solution (1 gr. in 100 c.c. water). This mixture was put into the oven, and kept for twenty-one hours at 38° C. It was then filtered. The filtered portion contains the albuminous substance of the meat turned into peptone, which is not precipitated by nitric acid, nor by potassium ferrocyanide and acetic acid. It is precipitated by tannic acid, and the xanthoproteic and biuret reactions are well shown. The non-peptonized residue of the meat weighs when dried 0.1 grm.

Therefore ninety per cent. of the solid portions of the meat had been dissolved in water. Of the albuminous substances of the meat eighty-seven per cent. were peptonized, which shows a very energetic degree of digestion.

b. For comparison, 5 grms. raw meat minced, 55 c.c. hydrochloric acid (0.2 per cent.), and 5 c.c. of a one per cent. solution pepsin were treated as above.

After twenty-one hours 70.6 per cent. of the albuminous substance of the meat was peptonized.

Experiment 2.—*a.* 5 grms. meat, 50 c.c. water, 0.5 c.c. of a one per cent. papoid solution.

After forty hours the non-peptonized residue of the meat weighed 0.19 grm.

Of the albumen of the meat 77.7 per cent. was dissolved in the water as true peptone.

b. 5 grms. meat, 50 c.c. hydrochlor. acid (0.2 per cent.), 0.5 c.c. of a one per cent. pepsin solution.

After forty hours the non-peptonized residue weighed 0.19 grm. Of the albumen of the meat 77.7 per cent. was peptonized.

Experiment 3.—*a.* 10 grms. meat, 20 c.c. water, 1.5 c.c. of a one per cent. papoid solution.

After thirty-six hours 73.5 per cent. of the albumen of the meat was changed into true peptone.

b. 10 grms. meat, 20 c.c. hydrochlor. acid (0.2 per cent.), 1.5 c.c. of a one per cent. pepsin solution.

After thirty-six hours eighteen per cent. of the albumen of the meat was changed into true peptone.

* Professor at University of Bonn, Germany.

RÉSUMÉ OF THE THREE EXPERIMENTS.

Ferment.	Digested albumen of the meat.	Time.	Proportion of the quantity of ferment to the meat.	Proportion of the quantity of meat to the liquid.
Papoid 1.	87 per cent.	21 hours.	1 to 100	1 to 10
Papoid 2.	77.7 per cent.	40 hours.	1 to 1000	1 to 10
Papoid 3.	73.5 per cent.	36 hours.	1 to 600	1 to 2
Pepsin 1.	70.6 per cent.	21 hours.	1 to 100	1 to 10
Pepsin 2.	77.7 per cent.	40 hours.	1 to 500	1 to 10
Pepsin 3.	18 per cent.	36 hours.	1 to 600	1 to 2

Papoid therefore shows a more energetic peptonizing power than pepsin, and specially so when the proportion of the liquid to the albumen is small,—*i.e.*, in the proportion of concentration in which food generally exists in the stomach and in the intestines. The great variability in the quality of commercial pepsin (some of which will under the most favorable circumstances not peptonize more than twenty per cent. of the albumen of the meat) gives papoid also the preference, as it is made of one uniform quality.

The peptonizing of hard-boiled egg (albumen) is demonstrated by the following experiments. (The tests were made in an oven at 38° C.)

Experiment 4.—*a.* 5 grms. albumen (hard-boiled egg), 50 c.c. water, 5 c.c. of a one per cent. papoid solution.

After sixty hours in oven, at 38° C., small residue, peptonized ninety-five per cent.

b. 5 grms. albumen, 50 c.c. hydrochloric acid (0.2 per cent.), 5 c.c. of a one per cent. papoid solution.

After eighteen hours all peptonized,—one hundred per cent.

Experiment 5.—*a.* 5 grms. albumen, 50 c.c. water, 0.5 c.c. of a one per cent. papoid solution.

After sixty hours all peptonized,—one hundred per cent.

b. 5 grms. albumen, 50 c.c. hydrochlor. acid (0.2 per cent.), 0.5 c.c. of a one per cent. pepsin solution.

After eighteen hours all peptonized,—one hundred per cent.

Experiment 6.—*a.* 5 grms. albumen, 10 c.c. water, 0.5 c.c. of a one per cent. papoid solution.

After forty-five hours peptonized eighty per cent.

b. 5 grms. albumen, 10 c.c. hydrochlor. acid (0.2 per cent.), 0.5 c.c. of a one per cent. pepsin solution.

After forty-five hours peptonized forty per cent.

Experiment 7.—*a.* 10 grms. albumen (egg boiled five minutes, rubbed down), 20 c.c. of a one per cent. papoid solution.

After fourteen hours all albumen is dissolved.

Reactions.—1. Boiling only produces a slight precipitate.

2. Xanthoproteic reaction succeeds very well.

3. Biuret reaction also shows very nicely.

4. Acetic acid and potassium ferrocyanide give slight precipitate.

The albumen is therefore all peptonized, one hundred per cent.

b. 10 grms. albumen, 20 c.c. of a one per cent. solution pepsin in 0.2 per cent. hydrochloric acid.

Albumen dissolves slowly. After forty-five hours only fifty per cent. of albumen is peptonized.

RÉSUMÉ OF THE FOUR EXPERIMENTS.

Ferment.	Albumen peptonized.	Time.	Proportion of quantity of ferment to albumen.	Proportion of albumen to liquid.
Papoid 4.	95 per cent.	60 hours.	1 to 100	1 to 10
Papoid 5.	100 per cent.	60 hours.	1 to 1000	1 to 10
Papoid 6.	80 per cent.	45 hours.	1 to 1000	1 to 2
Papoid 7.	100 per cent.	14 hours.	1 to 50	1 to 2
Pepsin 4.	100 per cent.	18 hours.	1 to 100	1 to 10
Pepsin 5.	100 per cent.	18 hours.	1 to 1000	1 to 10
Pepsin 6.	40 per cent.	45 hours.	1 to 1000	1 to 2
Pepsin 7.	50 per cent.	45 hours.	1 to 50	1 to 2

Result.—Hard-boiled egg is better digested by pepsin, if the quantity of liquid is larger in proportion. As soon, however, as a more concentrated mixture is employed superiority of the papoid is at once evident.

Second question: What effect can be obtained by the ferment in the human body?

a. Concentration of the solution is of first importance. It is impossible to create in the stomach and intestines such amount of liquid as would be favorable to the effect of pepsin. The conditions, therefore, are very much in favor of papoid.

b. Importance of the Reaction.—Pepsin acts in the stomach, but not in the intestines as in the latter. The reaction is neutral or alkaline. Papoid has little effect in the stomach, as the reaction there is acid. When, however, the stomach is neutral or alkaline, papoid will peptonize, while pepsin will be useless. The de-

gree (amount) of acid reaction in the stomach differs greatly, especially in case of a stomach out of order; in which case the reaction can be so highly acid or alkaline that pepsin would be of no value at all. In the treatment of stomach-catarrhs we will, moreover, find that, as a general rule, the contents of the viscus have been rendered artificially neutral or alkaline by the administration of remedies, so that in these cases pepsin will have absolutely no effect. Papoid, on the contrary, will act energetically.

c. Regarding the Time available for the Digestive Ferment to act in the Body.—In the case of pepsin this is necessarily very short, as the action ceases when the food enters the alkaline reaction of the intestines. In the case of papoid, which can act well in alkaline reaction, the time is practically unlimited, as it continues acting on the food during the whole time it continues in the body. For all these reasons the conditions for the effect in the human body are far more in favor of papoid than pepsin, and especially as under existing circumstances (high degree of concentration) papoid has been shown to act much more energetically. It is only too clear that the preference should be given to papoid as a digestive ferment for the treatment of dyspepsia. Besides dyspepsia, the papoid is of great importance in the treatment of diphtheria.

Its effective power consists in the circumstances that no free acid need be present in the application, and further that the moisture of the diphtheritic membranes is quite sufficient to allow the ferment to dissolve the solidified substances of the membranes. No other ferment has so far been able to obtain these results. It is on this account that many competent experimentalists and specialists have lately made observations.

From all these circumstances there is no doubt that in papoid we have a ferment which has a great future before it, and it is for this reason that I have made a special study of the manner of preparing the papoid, and I have had the satisfaction of obtaining the most favorable results from its use in the treatment of disease.

THE INFLUENCE OF ANTIFEBRIN, SALICYLIC ACID, AND CARBOLIC ACID ON NORMAL AND ABNORMAL BODILY TEMPERATURE.

By H. A. Hare, M.D. (Univ. of Pa.).*

(Continued from page 451.)

III. Carbolic Acid.†

THE influence of carbolic acid on temperature in the normal animal has not, that I am aware of, been studied, although Emil Erls‡ has found that in mild putrid poisoning it greatly diminishes fever heat, but if the poisoning be severe the acid has no influence.

On glancing at the following tables, which represent the results reached in a series of ten experiments on the normal rectal temperature of rabbits, it is evident that this drug acts much more positively than does salicylic acid, and we find that in every instance there was a fall in the normal bodily heat after the administration of the drug, though in one instance this fall ultimately ended in a rise, which passed above the original and primary temperature of the animal before the injection of the acid.

Experiment 1.—Rabbit; weight, 3 pounds. Gray doe.

Time. A.M.	Drug.	Rec. temp.	Remarks.
11.35	.....	$102\frac{3}{5}°$	
11 37	3 drops.	.....	Struggled hard when caught.
11.57	.....	103°	Drug injected hypodermically in 30 minims of glycerin and water.
12.17	.....	$102\frac{3}{5}°$	
12.37	.....	$101\frac{4}{5}°$	
12.57	.....	$101\frac{1}{5}°$	
1.17	.....	$101\frac{1}{5}°$	
1.37	.....	$101\frac{1}{5}°$	
1.57	.....	$101\frac{2}{5}°$	
2.17	.....	$101\frac{1}{5}°$	
2.37	.....	101°	
6.15	.....	$101\frac{1}{5}°$	Fall of temperature = $1\frac{2}{3}°$ F.

Experiment 2.—Rabbit; weight, 2 pounds. Black and white doe.

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† The carbolic acid used was made by Calvert and was chemically pure, and consisted of the drops obtained from deliquescence of the crystals.

‡ *Schmidt's Jahrbücher*, Bd. clxiv. p. 148.

Time. A.M.	Drug.	Rec. temp.	Remarks.
11.15	.....	103⅗°	
11.17	2 drops.	.....	Quiet.
12.05	.....	102°	Injected hypodermically in 30 minims of glycerin and water.
12.35	.....	101⅘°	
1.05	.....	102⅕°	
1.35	.....	.....	
2.05	.....	102⅕°	
3.00	.....	102⅖°	Fall of temperature = 1⅘° F.

Experiment 3.—Rabbit; weight, 2½ pounds. Black doe.

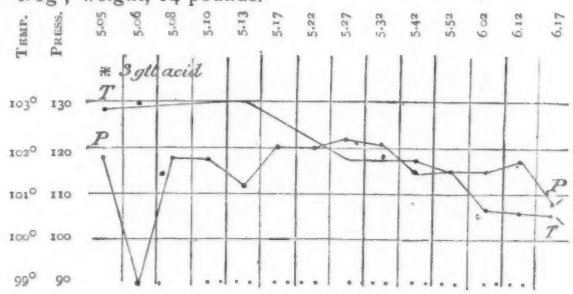
Time. A.M.	Drug.	Rec. temp.	Remarks.
10.55	.....	103⅗°	
10.56	2½ drops.	.....	Injected hypodermically in 30 minims of glycerin and water.
11.15	.....	102°	
11.35	.....	102°	
12.05	.....	101⅗°	
12.40	.....	101⅘°	
1.10	.....	102⅖°	
1.40	.....	102⅗°	Fall of temperature = 1⅘° F.

These results are likewise supported by the experiments performed to determine the relation between the arterial pressure and the temperature in the normal animal (dogs), in all five of which a fall of temperature occurred. I think we may, therefore, consider proven that this acid lowers normal bodily temperature.

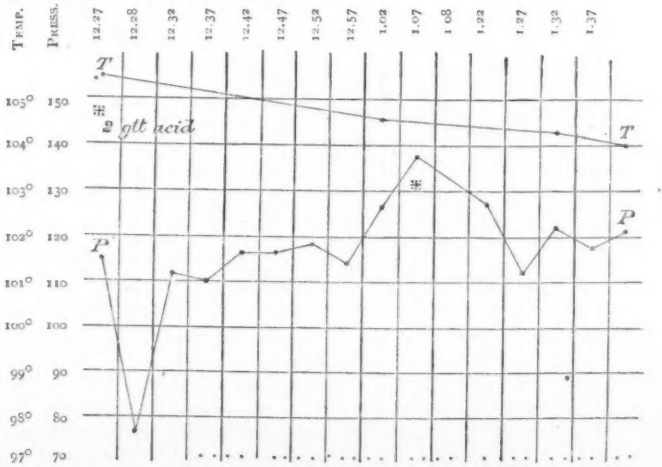
The charts showing the relationship between arterial pressure and the lowering of normal temperature by this drug indicate, at least in part, that there is a fall of pressure *pari passu* with the temperature, although in two of the five experiments the fall of arterial pressure was but momentary, and was followed by a rise. I can give no explanation of this variation. (Two charts left out for want of space.)

Charts showing Arterial Pressure and its Relationship to Temperature, also showing Fall of Temperature produced by Carbolic Acid when that Temperature is Normal.

Experiment 4.—Dog; weight, 14 pounds.



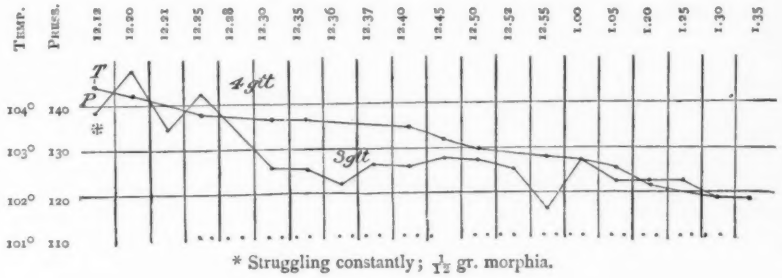
Experiment 5.—Dog; weight, 30 pounds.



* Struggling.

Chart showing Arterial Pressure and its Relationship to Temperature, also showing Fall of Temperature produced by Carbolic Acid when that Temperature is Normal (Continued).

Experiment 6.—Dog; weight, 42 pounds.

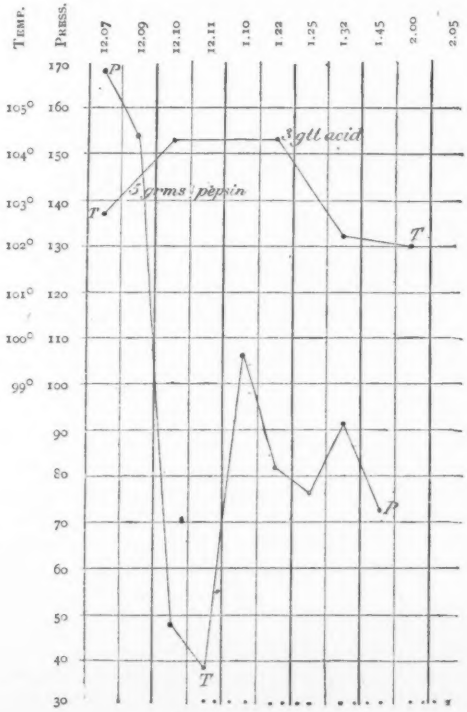


* Struggling constantly; $\frac{1}{12}$ gr. morphia.

On examining the charts showing the influence of carbolic acid on fever, and the relationship existing between arterial pressure and temperature in fever, we note that in three of the five experiments there was a marked fall of temperature, while in the remaining two there was a rise, or, in other words, the drug failed to control the pyrexia. In three of the experiments there was a fall of arterial pressure with a fall of temperature, in one there was a rise in pressure with a fall of temperature, and in another there was a fall in pressure with a rise in temperature. (One chart left out for want of space.)

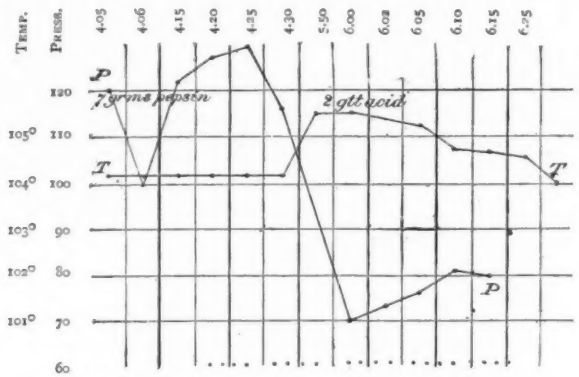
Charts showing the Relationship between Arterial Pressure and Temperature under the Influence of Carbolic Acid in Pepsin Fever.

Experiment 7.—Dog; weight, 19 pounds.

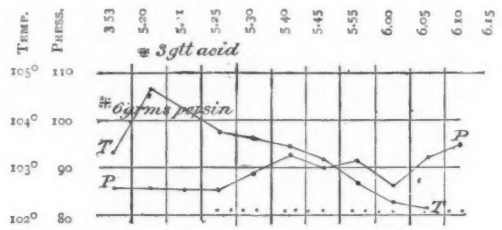


Charts showing the Relationship between Arterial Pressure and Temperature under the Influence of Carbolic Acid in Pepsin Fever (Continued).

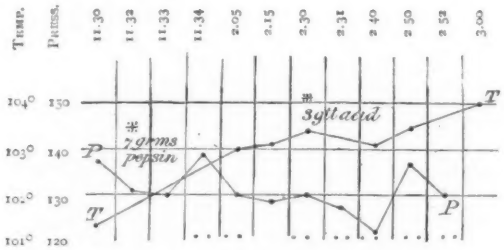
Experiment 8.—Dog; weight, 25 pounds.



Experiment 9.—Dog; weight, 26 pounds.



Experiment 10.—Dog; weight, 20 pounds.



Notwithstanding the fact that the two last named experiments conflict with the first three, I think that we may say that carbolic acid in lowering pyretic temperatures likewise lowers arterial pressure, and this view is strengthened by the results of the experiments performed on normal temperature.

Calorimetrical experiments made to determine in what manner carbolic acid lowers normal bodily temperature are, as might be expected from the irregular results obtained in the experiments just detailed, not very satisfactory.

It will be noted that in some instances production or dissipation were affected alone or together, while in others one function was decreased while the other was increased.

As the writer used the greatest care in the performance of the experiments there is but little room for fallacy, and, in view of the irregular action of the drug, it would seem

probable that it possesses no particular influence on either function, but may reduce temperature in some instances by acting on both functions.

Experiment 11.—Dog; weight, 18 pounds.

Time.	Rec. temp.	Box temp.
P.M.		
3.10	103.6°	57.00°
4.10	105.0°	57.95°
	1.4°	.95°
4.15	3 drops carbolic acid into jugular.	
4.25	104.5°	58.05°
5.25	105.2°	59.40°
	.7°	1.35°

Hourly dissipation of bodily heat..... 115.900
Hourly production of bodily heat..... 134.800

Hourly dissipation of heat after drug..... 164.700
Hourly production of heat after drug..... 174.150

SUMMARY.

Hourly dissipation of heat before drug..... 115.900
Hourly dissipation of heat after drug..... 164.700

Hourly gain of dissipation after drug.... 48.800

Hourly production of heat before drug..... 134.800
Hourly production of heat after drug 174.150

Hourly gain of production after drug.... 39.350

Result.—Gain of both functions, dissipation being most increased.

Experiment 12.—Dog; weight, 14.5 pounds.

Time.	Rec. temp.	Box temp.
A.M.		
10.35	102.7°	59.55°
1.50	103.0°	61.08°
	.3°	1.53°
1.55	3 drops of carbolic acid into jugular.	
2.00	102.7°	61.75°
5.15	103.6°	63.35°
	.9°	1.60°

Hourly dissipation of bodily heat..... 57.43400
Houly production of bodily heat..... 58.43784

Hourly dissipation after drug 60.06152
Hourly production after drug 63.07304

SUMMARY.

Hourly dissipation of heat before drug..... 57.43400
Hourly dissipation of heat after drug..... 60.06152

Hourly gain of dissipation after drug... 2.62752

Hourly production of heat before drug..... 58.43784
Hourly production of heat after drug..... 63.07304

Hourly gain of production after drug... 4.63520

Result.—Gain of both functions, production being most increased.

Experiment 13.—Dog; weight, 29.5 pounds.

Time.	Rec. temp.	Box temp.
A.M.		
10.35	103.5°	55.65°
11.35	103.6°	56.70°
	.1°	1.05°
11.55	4 drops carbolic acid into jugular.	
12.00	104.0°	56.50°
1.00	104.1°	57.40°
	.1°	.90°

Hourly dissipation of heat..... 128.100
Hourly production of heat..... 129.575

Hourly dissipation of heat after drug..... 109.800
Hourly production of heat after drug..... 111.275

SUMMARY.

Hourly dissipation of heat before drug..... 128.100
Hourly dissipation of heat after drug..... 109.800

Hourly loss of dissipation after drug... 18.300

Hourly production of heat before drug..... 129.575
Hourly production of heat after drug..... 111.275

Hourly loss of production after drug..... 18.300

Result.—Loss of both functions equally.

Experiment 14.—Dog; weight, 22 pounds.

Time.	Rec. temp.	Box temp.
P.M.		
1.15	103.4°	57.20°
2.15	103.5°	58.45°
	.1°	1.25°
2.40	4 drops carbolic acid into jugular.	
2.45	103.4°	57.95°
3.45	103.3°	58.85°
	.1°	.90°

Hourly dissipation of bodily heat..... 155.500
Hourly production of bodily heat..... 157.150

Hourly dissipation after drug 109.800
Hourly production after drug 108.250

SUMMARY.

Hourly dissipation before drug..... 155.500
Hourly dissipation after drug 109.800

Hourly loss of dissipation after drug..... 45.700

Hourly production of heat before drug..... 157.150
Hourly production of heat after drug..... 108.250

Hourly loss of heat production after drug. 48.900

Result.—Loss of both functions, production being the more decreased.

Experiment 15.—Dog; weight, 25 pounds.

Time.	Rec. temp.	Box temp.
P.M.		
3.50	105.5°	59.15°
4.50	104.6°	60.30°
	.9°	1.15°
4.55	4 drops carbolic acid into jugular.	
5.00	104.6°	60.00°
6.00	105.7°	60.90°
	1.1°	.90°

Hourly dissipation of heat before drug..... 140.300
Hourly production of heat before drug..... 123.425

Hourly dissipation of heat after drug..... 109.800
Hourly production of heat after drug..... 130.425

SUMMARY.

Hourly dissipation of heat before drug..... 140.300
Hourly dissipation of heat after drug. 109.800

Hourly loss of dissipation after drug..... 30.500

Hourly production of heat before drug..... 123.425
Hourly production of heat after drug..... 130.425

Hourly gain of production after drug.... 7.000

Result.—Loss of dissipation, gain of production.

The results obtained in the calorimetrical study of this acid on fevered animals are more concordant than those reached in the study on normal dogs, for we find that in Experiments 16, 18, and 19 heat production is very positively decreased, while in every instance where there was no decrease in production there was an increase in dissipation, which, while it did not always amount to a large enough quantity to overcome an increased production, had an effect in lessening the rise in temperature which might come on.

In one experiment, however (No. 20), production was very greatly increased over dissipation, simply because the thermogenic agent caused a rise in temperature which the acid could not affect. It would seem from these experiments that the acid lowers temperature by acting on both heat production and dissipation, the production being generally most affected.

Experiment 16.—Dog; weight, 21 pounds.

11.25 Rec. temp. 103.7°. Injected 2 grms. filtered pepsin.

Time. P.M.	Rec. temp.	Box temp.
12.02	105.0°	57.00°
1.02	104.7°	58.40°
	.3°	1.40°
1.05	3 gtt. of carbolic acid into jugular.	
1.10	104.8°	58.85°
2.10	102.8°	59.65°
	2.0°	.80°

Hourly dissipation of heat..... 170.800
Hourly production of heat..... 166.075

Hourly dissipation of heat after drug..... 97.600
Hourly production of heat after drug..... 66.100

SUMMARY.

Hourly dissipation of heat before drug..... 170.800
Hourly dissipation of heat after drug..... 97.600

Hourly loss of dissipation after drug..... 73.200

Hourly production of heat before drug..... 166.075
Hourly production of heat after drug..... 66.100

Hourly loss of production after drug..... 99.975

Result.—Loss of both dissipation and production. Loss of production very great.

Experiment 17.—Dog; weight, 16 pounds.

10.35 Rec. temp. 103.5°. Injected 2 grms. filtered pepsin.

Time. P.M.	Rec. temp.	Box temp.
2.15	105.2°	59.85°
3.00	104.1°	60.06°
	1.1°	.21°
3.01	3 drops of carbolic acid injected into jugular.	
3.12	104.0°	60.80°
3.57	103.1°	61.35°
	.9°	.55°

Hourly dissipation of heat..... 32.025
Hourly production of heat..... 15.525

Hourly dissipation after drug..... 83.875
Hourly production after drug..... 70.375

SUMMARY.

Hourly dissipation of heat before drug..... 32.025
Hourly dissipation of heat after drug..... 83.875

Hourly gain of dissipation after drug..... 51.850

Hourly production of heat before drug..... 15.525
Hourly production of heat after drug..... 70.375

Hourly gain of production after drug..... 54.850

Result.—Gain of both dissipation and production, production being affected most.

Experiment 18.—Dog; weight, 34 pounds.

1.40 Rec. temp. 104°. Injected 2 grms. filtered pepsin.

Time. P.M.	Rec. temp.	Box temp.
4.00	105.6°	61.50°
5.00	105.7°	62.95°
	.1°	1.45°
5.02	Injected 4 gtt. of carbolic acid into jugular.	
5.20	105.6°	62.95°
6.20	104.0°	64.05°
	1.6°	1.10°

Hourly dissipation of heat..... 176.900
Hourly production of heat..... 179.450

Hourly dissipation after drug..... 134.200
Hourly production after drug..... 93.400

SUMMARY.

Hourly dissipation before drug..... 176.900
Hourly dissipation after drug..... 134.200

Hourly loss in dissipation after drug..... 42.700

Hourly production of heat before drug..... 179.450
Hourly production of heat after drug..... 93.400

Hourly loss of production after drug.... 86.050

Result.—Both functions decreased, the production being greatly decreased.

Experiment 19.—Dog; weight, 14½ pounds.

10.30 Rec. temp. 102.2°. Injected 1 grm. filtered pepsin.

Time. A.M.	Rec. temp.	Box temp.
10.50	104.0°	57.85°
11.50	103.5°	58.80°
	.5°	.95°
11.53	3 gtt. carbolic acid injected into jugular.	
11.55	103.5°	58.75°
12.55	99.0°	59.70°
	4.5°	.95°

Hourly dissipation of heat..... 115.9000
Hourly production of heat..... 110.4625

Hourly dissipation after drug..... 115.9000
Hourly production after drug..... 66.9625

SUMMARY.

Hourly dissipation before drug..... 115.9000
Hourly dissipation after drug..... 115.9000

Hourly dissipation after drug unchanged.

Hourly production before drug..... 110.4625
Hourly production after drug..... 66.9625

Hourly loss of production after drug... 43.5000

Result.—Dissipation not affected. Production greatly decreased.

Experiment 20.—Dog; weight, 28 pounds.

2.10 Rec. temp. 103°. Injected 2 grms. filtered pepsin.

Time. P.M.	Rec. temp.	Box temp.
3.15	104.2°	60.00°
4.15	104.7°	61.65°
	.5°	1.65°
4.18	3 gtt. carbolic acid into jugular.	
4.20	104.6°	61.60°
5.20	106.3°	63.50°
	1.7°	1.90°

Hourly dissipation of heat..... 203.300
Hourly production of heat..... 213.800

Hourly dissipation after drug..... 231.800
Hourly production after drug..... 288.500

SUMMARY.

Hourly dissipation of heat before drug..... 203.300
Hourly dissipation of heat after drug..... 231.800

Hourly gain of dissipation after drug.... 28.500

Hourly production of heat before drug..... 213.800
Hourly production of heat after drug..... 288.500

Hourly gain of production after drug 74.700

Result.—Both increased, production being more increased than dissipation by a considerable amount.

CONCLUSIONS.

1. Carbolic acid possesses considerable power in lowering normal bodily temperature.

2. It possesses more influence over pyretic temperature than does salicylic acid, generally preventing a rise or causing a fall of temperature, but sometimes failing to do so.

3. Carbolic acid probably decreases arterial pressure when lowering temperature.

4. That its mode of decreasing normal bodily temperature is as yet not fully understood, although it would seem probable that it acts on both heat functions.

5. When influencing bodily heat in fever it acts chiefly by decreasing production, although it affects both functions.

CURIOSITIES OF THERAPEUTICS.

By G. Archie Stockwell, M.D., F.Z.S.,
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III. PRE-HISTORIC AND MYSTICAL MEDICINE.

MOST aptly has it been said that "The proper study of mankind is man." Certainly there has never been offered a problem more abstruse, extended, or difficult of solution than the origin of the human race, and the causes that led to its present mental and physical development. Even those whose orthodoxy is so far above reproach as to spurn the shadows of the doctrine of Evolution as "unclean," do not hesitate to grope among the secrets of the primitive and infinite; and it is no anomaly to discover in the most ardent exponents of a miraculous creation as applied to Life and Intelligence, eager students in the domain of anthropology.

So long as the Assyrio-Chaldaic traditions and anachronisms perpetuated in the Pentateuch* were unreservedly accepted as Divinely

* Not until after the second century was it demanded of human credulity to accept the Pentateuch as the work of the great Hebrew law-giver, or even as of *one man*. The idea originated not among the higher ranks of Christian philosophers, but the more fervid Fathers of the Church, whose writings evince they were neither very critical nor very learned persons. The ablest men of every age, Christians and Jews alike, have repudiated these claims, and their decisions have been based upon

inspired history, and a Hebrew "Adam"* deemed both the type and derivative of all humanity and intelligence,—his vocalizations even the foundation of speech and thought,—little was demanded of the mysterious Past. But, when it came to be recognized that the language of Israel is neither primitive nor exclusively derivative; that cosmogonical mensuration could no longer be compressed within the limits of four brief figures; that civilization antedated Scripture and its chronology; that the genealogy of Shem is but a succession of names representing a few out of existing millions of families made to pass before a veil of darkness the momentary liftings of which gave glimpses of great movements that had been long going on behind; that Asia was the seat of mighty empires, and Africa the home of arts and sciences at a time when Noah is accredited with laying the keel of the ark;—a wide vista for study and research was opened, the extent of which even yet is beyond the power of the human understanding to grasp.

For centuries the intelligence of the world has sought in the "Lands of Extinct Monarchies"—Egypt, Arabia, Syria, and Asia Minor—more definite information regarding the early history and development of the human race, ignoring the teaching of geology that the *Western* is the older of the Hemispheres and tropical American latitudes the probable birthplace of terra firma.† Oriental research, in spite of the magnificent results accruing thereto, have ever been unsatisfying as regards evidences of periods antedating those of existing history, and of arts and sciences that were not contemporary with or derived from the Phœnician and Egyptian:‡ the more eager the search, the further removed appeared the bridge that would span the gap existing between early civilization and a primitive nomadism. Such was the status of anthropology up to within the last decade.

Unfortunately, the lifting of the veil was not

the intrinsic evidence of the books themselves. These furnish conclusive indications of being derived from two narratives, each distinct and independent, and often contradictory. The claim of Mosaic authorship was not advanced by the early Church authorities, nor did it obtain until deemed essential to the unity of the doctrine of the *Atonement*. Esdras expressly declares the books were written by himself and five others in the space of forty days (2. xiv. 20–44), being led thereto by inspiration and a desire to perpetuate "from the beginning" the history of a race whose records had all been destroyed. True, the writings of Esdras are held apocryphal, but not by any evidence that will withstand modern criticism (see McClintock and Strong's "Biblical, Theological, and Ecclesiastical Cyclopædia," vol. iii. pp. 293–296); indeed, the Hebrews and more intelligent Fathers ever upheld its canonicity. But whether or no, the Pentateuch presents peculiarities that conclusively demonstrate it was composed on the banks of the Euphrates instead of in the deserts of Arabia. It abounds with Chaldaisms, it speaks of the Mediterranean as lying in the *West*, which no Egyptian would do, and the scenery and properties are all Assyrian. (See Draper's "Conflict between Religion and Science," pp 220–223.)

* Unaccountably the errors peculiar to early and imperfect translation yet persistently obtain. In Genesis, the *Adam* and *ish* of the original Hebrew are accepted as synonymes for *man*, though scholars have long understood the one is discriminative and specific, the other generic. For instance, *Genesis* i. 26, 27, should read, "*Elohim* (God) *said, Let us make Adam in our image, . . . and Elohim created the Adamite* (ha-Adam) *in his own image . . . male and female created he them.*" Subsequently, throughout both the Elohistic and Jehovistic narratives, *Adam* with the definite article (*ha*) prefixed is employed exclusively for the descendants of a defined individual. The Hebrew invariably employs *ish* (feminine *ishah*) as descriptive of humanity at large. "*And it came to pass . . . that the sons of God* (Adamites) *saw the daughters of men* (ishah) *that they were fair; . . . and Jehovah said, My spirit shall not strive with the Adamite forever; . . . when the sons of God* (Adamites) *came in unto the daughters of men* (ishah); *. . . and it repented Jehovah that he had made the Adamite* (ha-Adam) *on the earth* (adamah). . . . *Jehovah said, I will destroy the Adamite* (ha-Adam)," etc. (Genesis vi. 2, 3, 4, 6, 7.) Even more marked is the distinction in *Psalm* xlix. 1, the reading of which, as given by competent Hebrew scholars, is, "*Give ear all ye inhabitants of the world, both Adamites and sons of men!*" Those who desire to pursue this topic more critically will find an exhaustive article in one of the earlier volumes of *Scribner*.

† See Sir Charles Lyell's "Principles of Geology." Reber ("History of Ancient Art," p. 1) remarks, "It is a curious chance that the most ancient monuments of human civilization should stand upon a land that is the youngest geological formation of our earth."

‡ The United States, while founding schools of archæology in Egypt and Greece, has persistently ignored the treasures of the American continents. In the first "Annual Report of the Archæological Institute of America" it is authoritatively declared that these treasures pertain "to a race that never attained a high degree of civilization," and that has "left no trustworthy records of continuous history." Again, "It was a race whose intelligence for the most part was of a low order; whose sentiments and emotions were confined within a narrow range, and whose imagination was never quickened to find expression of itself in poetic or artistic forms of beauty. *From what it was or what it did, nothing is to be learned that has any bearing on the progress of civilization!*"

This *without taking the trouble to make a single examination*, and at a time when European scientists, with the reverence true learning begets, were turning their attention to America in quest of the origin of those ancient civilizations which they had been unable to find in countries where they once flourished!

permitted those upon whom the privilege should naturally have fallen, but to able scholars and antiquarians of the "*Old* World" so called, whose eyes were not blinded by the ignorant pretensions of pseudo-science; and the little that has come to us is the sequel of labors of the *Société* and *Congrès des Américanistes*, the archæological department of the *University of Cambridge*, and the individual exertions of Monsieur and Madame Le Plongeon, M. Désiré Charnay, and Mr. Maudslay. Attracted to Central America by the reports of Stephens and Norman, years of toil and hardship have been devoted to the unravelling of the mysteries of Yucatan, Honduras, Guatemala, and Southern Mexico, whereby has been secured an amount of information that is positively startling in its bearings upon history, geography, eschatology, theology, tradition, and art. It gives a better and deeper insight into the sciences, including mathematics, therapeutics, physiology, and psychology; affords a key to mysterious and obscure myths and Orientalisms; and has also unlocked the more secret records of philology. During this period silent and hitherto impenetrable forests were traversed, searched, and forced to yield up the ghosts of a forgotten, mysterious, and progressive civilization; ruins cleared, excavated, ransacked, and photographed; temples, pyramids, palaces, vaults, tombs, tumuli, and astronomical and memorial chambers explored; obelisks and *bas-rilievos* uncovered that rival those of Egypt and Assyria;* languages acquired, hieratic alphabets mastered, and hidden records, and glyphic and other mural sculptures, deciphered and transcribed. In the city of Uxmal was found glyphically inscribed the narrative of Adam and Eve, along with the history of their three sons and two daughters; and both here and at Chichen-Itza numerous other familiar traditions, no longer mere insignificant and fragmentary Hebrew or Assyrio-Chaldean myths without order or sequence, appear as part of the consecutive history of a nation whose existence by some thousands of years antedates accepted chronology. The original of the "Temptation in the Garden" and "Fall of Man"† is told, and none the less valuable because shorn of its Chaldaisms, and the interpretation placed thereupon by Anselm and the superstitious monks and prelates of the earlier centuries of our era;‡ and the fratricidal strife depicted in the fourth chapter of *Genesis* is given not only as a part of this tragedy, but appears to have been the first act thereof.§ The identity of the unfortunate *Abel* of Hebrew literature, *Abal* of the Assyrio-Chaldeans, *Bali* of the Sanskrit, *Balaam* of Petra, *Osiris* of Egypt, and Prince *Coh* of Mayax, is apparently beyond dispute.‖ Sculptures of his wife, mother, sister, and children, weeping over his ensanguined corpse and preparing for cremation and the formalities to be paid to his *manes*, appear on the façades of numerous structures; while deep in the interior of a mound, in a sepulchral chamber of hewn and massive stone, was exhumed his statue with tablets of name and rank, the urn containing his heart, the ornaments that he wore, and the blade of flint that struck the fatal blow, all of which are now in the possession either of the National Museum of the Republic of Mexico or of their discoverer.¶

Not the least important of the records brought to light are those that give back to us the great island continent of Herodotus, Solon, Euclid, and Plato, so long deemed fabled, and of which the Azores, Bahamas, Madeiras, Canaries, Cape de Verds, and Lesser Antilles are the mortuary remnants.** Atlan or Atlantis, no longer a myth, is become a glorious reality occupying a place in history, geography, and archæology, second in interest only to that of Mayax itself, since

* See "Yucatan, its Ancient Palaces and Modern Cities," by M. Augustus Le Plongeon; also, by the same author, "Sacred Mysteries among the Mayas and Quiches;" "The Monuments of Mayax and their Historical Teachings;" "Vestiges of Antiquity;" "Vestiges of the Mayas;" "The Inhabitants of Peru and their Civilization."

† Appendix K.

‡ In the earlier ages of Christianity the story of the "Fall" had not been incorporated as an essential part of the creed of the "Faith." It was Anselm that gave to it the precision as now taught in Protestant and Romish Churches. See "Conflict of Religion and Science," Draper, pp. 57, 222.

§ Appendix K.

‖ It is significant, to say the least, that the names of the various personages mentioned in the different accounts of this fratricide are practically identical. See Appendix K.

¶ The manifest value of these treasures historically, as well as their connection with the antiquities of the Republic, was such the Mexican Government would permit only a portion to pass out of the country. The statue of Coh, and the tablets engraved with his titles and rank and appearing as head ornaments, as well as numerous other Maya antiquities (or their copies) referred to in this paper, were viewed by the writer during a recent visit to the "Sister Republic."

** Wyville Thompson's "Voyage of the Challenger." Also Appendix L.

it must needs have been the highway over which passed the germs of those arts, sciences, religions,* traditions, and languages we call our own. That the island was once the scene of human greatness, and the theatre of a civilization superior to that of Egypt in her palmiest days, is already established; and lying exactly in the track of the greatest cataclysms known to our globe, we can readily imagine a convulsion of Nature that would at the same moment engulf a city in Jamaica and another in Portugal, might also submerge a continent.

The discovered hieratic alphabet of ancient Mayax affords convincing evidences of being the derivative of the hieratic characters of the twin civilizations of Egypt and Chaldea, whence was obtained our own written language; and by its aid have been mastered the secrets of the *Troano*, *Popul-Vuh*, and *Cakchiquel* MSS.,—three of the four sacred books that escaped destruction at the hands of Bishop Landa and his fanatical following when, at the termination of the twenty years' war termed the "Conquest," Rome and the Inquisition undertook to regulate both the temporal and spiritual affairs of "New Spain." We also find that when Uxmal was the political capital of an empire that extended its influence over *three*, and indirectly over *six*, continents, the city of Chichen-Itza was the seat of letters and the metropolis not only of the civilization of Mayax and its dependencies, but of the world. It was the Mecca of science, philosophy, and art, embracing literature, medicine, theology, astronomy, and astrology, and was sought by the wise men of Africa, Europe, and Asia, including India and far away Manchouria and Japan,† that they might sit under the teaching and higher wisdom of the *H-Menes*, or sacred priests. Here progressive Hindus, Thibetans, Mongolians, Aryans, Chaldeans, Ethiopians, Egyptians, Iberians, and Atlans‡ met to worship at the same shrines and altars, and to offer homage to the mysterious deified *Intelligence*, or to sacrifice by casting themselves headlong into the sacred well from which the city derived its name.

Our information regarding the peculiar religious tenets of ancient Mayax is as yet too meagre to admit of definite interpretation or description, though it appears to have been a highly educational form of Theosophism, but triflingly related, however, to the modern doctrine that obtains under this name. By comparing the little knowledge that thus far has been vouchsafed, with that possessed of the faiths of races lower in the scale of civilization, we discover progressive intellectual development by series, the sequence being almost without shadow or flaw.§

* The evidences collected by Le Plongeon, Charnay, and Maudslay, and that are verified by the ancient *Troano* MS., have been supplemented by: First, the more recent discoveries by the second-named gentleman, as narrated in the *North American Review* for September, 1880; second, in 1884, some workmen engaged in excavating upon the Caribbean coast of Nicaragua unearthed a huge rock covered with sculptures and glyphs that, when deciphered by experts, were found to be a brief record of the submergence of a vast extent of territory that formerly existed in the expanse measured by the central Atlantic and Saragossa Sea: an event, according to Egyptian authority, that took place somewhere about 9600 B.C.

† Sacred Mysteries of the Mayas and Quiches, pp. 50, 53, 57, 61, 73, 95.

‡ The *Troano*, and the sculptures and engraved records unearthed by Charnay, Maudslay, and Le Plongeon, all depict or describe individuals received in Mayax as honored guests, who present vividly many of the race characteristics of our era: bearded Assyrians, or men reminding one of the Afghans of the present; classic Aryans; sensual Egyptians; flat-nosed Ethiopians; and a dark race with red lips possessed of magnificent *physique* supposed to be Atlans, and that would seem to be nearly akin to the Minas of the Benin region (a tribe familiar with the teachings of the Koran and Arabic literature, superior in intelligence to the Arabs, and nothing in common with the negro of the type with which we are most familiar). Among scores of sculptures and statues found by M. Charnay was a negro's head of life-size, perfectly designed even to the curly hair; another, the face of a woman that, save for a battered nose, exactly resembles the present European type, reminding its discoverer of the "Venus of Milo"; and at Tula in the state of Chiapas was unearthed a mould, a cast of which in paraffine exhibited an Aryan beauty with locks arranged in modern fashion, crowned with a braid of false hair. (*North American Review*, Sept. 1880.)

§ The little that remains to us of the history of the *Natchez* and other lower Mississippi tribes, and of the Moquis or Pueblos, is evidence they were intermediates of the existing aborigine and the ancient *Shyris* and *Quichuas* of Ecuador, Bolivia, and Peru,—the latter an offshoot of the *Quiches;* and yet the descendants of Manco Capac (an imitator of the Mayax *Cans*) were not so far advanced in the civilized scale as the Chontales and other non-Maya tribes of Central America, who were yet inferior to the people of Yucatan. The Aztecs more nearly resemble the ancient Quiches. Slavery and Romanism, however, stamped out the last vestiges of civilizations in most respects superior to that of the Latin conquerors. A remnant—now seen in the final stage of reversion to primitivism—yet lingered among the Pueblo tribes who, shaking off the yoke of their oppressors, to some extent escaped the contaminating influence of European immigration, and preserved in part the language, customs, traditions, and religious rites of their early ancestors. This is borne out by the

In the *H-Menes*, or pontiffs, of Chichen-Itza is seen an elevated type of the *Quiche* priesthood that in turn ranks higher than the sacerdotal orders of the *Incas*, between whom and the *Shams** of primitivism stand the sacred orders of Zuni. Again, *Kitche-Manit*, or the "Great Spirit" of the nomad,† as the result of broadened intelligence and education on the part of his worshippers and following, had been lifted to a higher plane, becoming more powerful, terrible, and unapproachable, save perhaps to the favored few,—"*the elect*," —at the same time more munificent and complete. The "*medicine*" *lodge*,‡ no longer a mere hut, the esoteric wisdoms of which were concealed from the vulgar by the skins of wild beasts or the rinds of trees, is transformed into temples of hewn stone, grand in their massiveness, palatial in their apartments and appointments, and impressive by reason of the knowledge therein hidden, including the rites and ceremonies sacred alike to Deity, philosophy, and art. And the ordeals, though less savage, less vulgar, were become even more severe and appalling with each step that approached the unknown and carefully guarded "*Holy of Holies*"; the initiations were calculated to progressively educate, and yet test to the utmost the physical and intellectual capacity and endurance of those who sought the closest possible communion with the mysterious power deified as the "*Supreme Intelligence*."§

In the sacred temples or colleges was inculcated the majesty and greatness of the *Supreme* in Nature and in Art, and likewise of the existence of a *power* between, or a psychic essence emanating therefrom, superior to Life and Matter! To reach this power and render it amenable to and a part of the understanding, was the high aim of the *Mysteries*, the pathway being progressive knowledge and intelligence. In no sense were the colleges schools of pagan polytheism, save, perhaps, indirectly. While adoration was paid the celestial bodies, the mastodon,‖

little Mr. Frank Cushing has revealed to us of the *Mysteries* yet practised among the Zunis, to which he has been admitted. Of course, I do not pretend to say these peoples and races, *all*, are absolute links in the chain, but merely *typical* of such links.

* THERAPEUTIC GAZETTE, April, 1887, p. 234.

† Ibid., p. 229. ‡ Ibid., p. 236.

§ See Appendix M; also the scriptural record of *Enoch* and *Melchizedek*. It is an open question whether the man that "*walked with God*" and subsequently "*was not*," is not identical with *Malki-Tsĕ-dek* (Melchizedek). Evidently both were high pontiffs of the *Mysteries* in some part of the world, whether in the plains of Arabia or groves of Mayax. *Enoch*, *Chanok*, or *Hanoch*, as the word is variedly rendered, means simply "*Initiated*," and *Malki-Tsĕ-dek* a "*Priest of Elyon*," or "*First among the Holy*." Says Rev. Dr. McClintock, "There is something surprising and mysterious in the first appearance of Melchizedek and in the subsequent reference to him. Bearing a title which would in after-ages be recognized as that of a sovereign, bringing gifts which recall to Christians the Lord's Supper, this Canaanite crosses for a moment the path of Abraham, and is unhesitatingly recognized as a person of higher spiritual rank than '*The Friend of God*.' Disappearing as suddenly as he came, he is lost to sacred writings for a thousand years, and then a few emphatic words bring him into sight as a type of the coming of the Lord of David. . . . The faith of early ages continued to invest his person with superstitious awe, and a mysterious supremacy came also to be assigned to him, because of his having received gifts from the Hebrew patriarch." ("Biblical, Theological, and Ecclesiastical Cyclopædia," vol. vi. p. 87.)

Enoch, or Cân-ok, was the son of *Câin*, names so like *Cay* and *Can* as to suggest he was the high pontiff of Mayax and brother of *Aac* (Can II.), *Coh*, *Moo*, and *Nicte*. A *Cân-ok* is also mentioned as a son of Jared ("*Next Descended*"), and by Jude termed the "*Seventh from the First*," and probably a *seventh* high pontiff whose translation (*Genesis* v. 24) may have been that of apotheosis merely. The book of *Enoch*, or *Hanoch*, which is spoken of by Zohar as "an independent Hebrew production handed down from generation to generation," a MS. copy of which was rescued from oblivion and brought from Abyssinia in 1773, is little known owing to its supposed apocalyptic character. However, McClintock assumes it to be the identical book quoted by Jude ("Bib. Theolog. and Eccles. Cy.," vol. iii. p. 226), and declares that it "*exhibits a great advance of thought within the limits of revelation in each of the great divisions of knowledge*" (p. 227). Among other things it teaches the spirits of the wicked will be taken from *sheol* and consigned to a place of greater discomfort if not fitted for better things. Compare this with the *happy hunting-grounds* of the nomad (THERAPEUTIC GAZETTE, April, 1887, p. 231). Le Plongeon sees in the book a key to the ancient Mysteries, and remarks the similarity of its utterances to those of the *Popol-Vuh*, the sacred book of the Quiches. (Appendix N.)

‖ The mastodon in Egypt became the bull *Apis*, in consequence of the latter being the largest animal of its class (*Mammalia*) known to the country. In India it became the elephant, the deity of wisdom (Ganesha), whose body is painted *red* or *copper color*. The *Mystai* were taught as the Brahmins are taught to-day, that this emblem, whether a *red* mastodon, *red* elephant, or *red* bull, should be regarded as an *emblem of the soul, as embodying power and greatness*.

Strange to say, *Adâm* has the significance of *red* or *first red ruler; red* is the color of the American aborigine, and *red* was a symbol of nobility or race, and divine descent among the Egyptians. However, on the façade of the *Kuna*, or "Temple of Divine Intelligence," in Chichen-Itza is seen a tableau of adoration of the mastodon, over the trunk and between the eyes of which is a human face surmounted by the royal crown. The corona of the upper cornice is the emblem of the *serpent*, the token of the royal *Cans*; that of the lower is formed

the serpent,* the parrot, the palm,† and even apotheosized members of the human family, such were merely tributes to learning, and susceptible, among the higher *Mystai* or initiated, of esoteric explanation whereby the figures were resolved into symbols of the power of Nature, each within its own kingdom or class, and reconciled to the monotheism expressed by *The Supreme Intelligence*. Indeed, idolatry, like the manifestations of some forms of Christianity, developed from the ignorance and debasement of the masses proportionately with the decline of education and art, and the subversion of the lofty aims inculcated by the *Mysteries* to the debauchery of politics and sensuality. Maya monotheism begat polytheism by esoterically ascribing a triune existence to the *Supreme*,‡—the "*Creator*," the "*Engenderer*," and the "*Giver of Being*." In a less advanced *Degree* of the *Mysteries*, the *Trinity* was pictured as a *Quinquenate*,§ still lower a *Septenate*,‖ and in the first or lowest of all as a *Duodenate*,¶ whence the mystic power ascribed to the figures 3, 5, and 7. From the latter the vulgar evolved deities at will (aided by the political machinations of individuals), having no conception of the true meaning of the *Supreme* Deity, or of the figures that to the initiated conveyed evidences of his universality. A study of the polytheism of Egypt, Chaldea, India, and China evidences this; moreover, it is well understood on both sides of the Atlantic that an unknown but mystical significance has ever been ascribed to these numbers, and that by the Brahmins, Buddhists, Guebres, Mahaatmas, and "Adepts" they are held to be potentially, if not Divinely, endowed, or, as Pythagoras puts it, "*The vehicle of life containing both soul and body.*"**

From Chichen-Itza Maya civilization extended its influence to the farthest parts of the globe, exercising a controlling power among heterogeneous nations. History, art, philosophy, medicine, and the sciences in general were taught as the *Mysteries* gained ground, and everywhere the country whence the latter originated was regarded with veneration and respect. To-day, also, we encounter the word Maya in many regions, often most remote one from another,—in Europe, Africa, Asia, as well as the two Americas,—and always with the attached meaning of *original* or primitive power and wisdom; and wherever found, are also discovered traces of the language, customs, and religion of ancient Mayax, and its cosmogonical and historical traditions embodied in sacred writings and regarded as the history of mankind.†† By comparing the hieratic alphabets of Chaldea and Egypt with that of Mayax, the proposition that the former are indebted for their origin to the latter becomes something more than a mere surmise: the relationship is unmistakable. The radical MÂ, or "*first*," the equivalent of our letter *M*, in all three is the symbol of the universe. MÂ-YÂ means simply the "*first derived*" or "*first out of the water*,"—*terra firma*; MÂM stands for "*ancestor*"; AH ÇAMÂ or AH-DAMÂ for "*first of earth*" or *royal first*, a title given to but one of the *Cans* of Mâyax, while the others are designated as AHAU-MÂ, "*royally descended*." Again, we find a brotherhood in India who from time immemorial have borne the name of MÂHÂ-ATMA, or the "*Soul of Souls*," which exactly expresses their religious claims; and LA-MÂ, or "*that which has existed from the first*" (eternal truth), is the title of the Thibetan form of Buddhism. LÂB-MÂC, the "*Venerable*," is identical with the *Râb-Mâg* of the Chaldeans, and is the designation of a high priest or pontiff; and MÂ-GI or MÂ-YI was applied to those possessed of the Maya knowledge (the *Mysteries*), and, like the title of *Doctor* to-day, obtained among charlatans as well as the learned. From the writings of Daniel we gather the *Mâgi* or *Mâyi* of his day were *strangers possessed of special learning and speaking an unknown tongue*,‡‡ and that they were a powerful society, esoteric and quasi-religious in character, who passed their time in meditating upon questions of philosophy and science, or in practising divination, astrology, therapeutics, and psychomancy. In the last, however, they were surpassed by the "Son of David" and by his companions, who, being of the blood royal, presumably had attained the highest rank in the Hebrew *Mys-*

of characters that read *Ah-âm*,—the "first," or "he of the throne."

* See p. 531.

† See p. 531.

‡ "Sacred Mysteries of Mayas," pp. 53, 60–66, 91, 136. Appendix M.

§ Ibid., pp. 63, 65, 142.

‖ Ibid., pp. 143, 149.

¶ Ibid., pp. 48, 96.

** In the THERAPEUTIC GAZETTE for May last (p. 301) I commented upon the fact that *Shams* and *shamman* lodges are the repositories of the facts, traditions, and other knowledge of Primitivism, under the absurd title (as rendered) of "*medicine*." See also U. S. History as to the sacred lodges of the Natchez tribe in connection with an intended (universal) massacre of the whites!

†† Appendix M.

‡‡ Books of *Daniel*.

teries, and, moreover, by order of Nebuchadnezzar, had also acquired all the "wisdom" of the sacred colleges of Chaldea. In the short space of three years Daniel had risen to Chief Pontiff or "Venerable" of the kingdom, and undoubtedly it was his better knowledge of the means of procuring *ecstasia** and the clairvoyant state, that procured him honors and caused him at the same time to decline the luxuries ("delicacies") of the king's table. As the higher and more complete wisdom of the *Mysteries* inculcated *caste*, we can imagine the Mâyi, foreigners from India,† probably, who had settled in Babylon for "profit and gain," were not the most exalted of the sacred ranks, for it is rare indeed that any considerable number of emigrants represent the best learning of the country of their birth.

The totem of the primitive *kingdom* of Mayax was a *serpent*, typical of water or the sea,‡ bent to represent the coast of Yucatan, while the peninsula itself was often typified as a *garden*. But the insignia of the *Empire* of Mayax, which extended from the isthmus of Darien to that of Tehuantepec, was sometimes a tree§ with its roots in the continent of South America, the peninsula of Mayax being the chief branch, and sometimes (more frequently) *a serpent with an inflated breast*, the outlines of which exactly recalled the geographical contour of the country.‖ This serpent was also employed as the emblem of royalty and apotheosized royalty as expressing wisdom second only to that of the Divine Intelligence, and as such it appears as a head ornament in sculptures and gravures. Also, this latter reptile is, manifestly, the "asp" of the Nile region, where it is frequently depicted wearing the crown of Lower Egypt, said crown being but the Maya royal appendage reversed, —the front looking backward; this reversal, perhaps as a mark of respect, and intended to inculcate the principle yet obtaining among the people of Yucatan, that as the child is *less*, it should always appear *inferior*, and in *homage* to the parent,—*i.e.*, stand behind him.¶ Nine thousand and more years subsequent to the submergence of Atlan that interrupted communication between the two hemispheres for a hundred and half a score of centuries, we find this "asp"—so called, though with but trifling resemblance to the *naji haji*, or cobra—as the emblem of the royalty and wisdom of Egypt, and as such adored under the title of *Mâ ti* or *Uâ-ti*, typical of *Amenti*, or the "Land of the West," to which the souls of the departed were expected to *wing* their way.** The "ark," too, is observed as part of the properties of the early Egyptian and Chaldean *Mysteries*, whence it obtained place in the religious worship of the Hebrews; it was generally in the form of a *caique*, or boat, and in each case was cherished within the "holy of holies" as a "covenant" or *bond*, the real significance of which was its former use as a means of communication between the lands of the West and those of the East, such as was possible before the destruction of the "Lost Continent."

Regarding the *tree* emblem, we know that grove or tree worship is yet extant in many parts of our globe, and in Yucatan it is still the custom to surround houses of worship with the emblem of the Maya Empire, the *cieba* tree. In this is also found a key to the grove Mysteries of the Hellenic Peninsula and Greek Mesopotamia, the Druidical rites of Œsus, the oaks sacred to the royal Baal of the Phœnicians or Assyrians, the ash venerated by the Scandinavians, the tamarind adored in Egypt, the palms of Delos and Ceylon, and the significance of the banyan, or *Ficus Indicus*, in the Deccan; in each instance the tree selected being the most hardy and enduring of the region, and therefore typical of *strength*. Also, we obtain better understanding of the significance of the brazen serpent reared in the wilderness by Moses,†† who, as the putative child of Thonoria and grandson of a Rameses, would obtain early initiation into the *Mysteries*, the influences of which are everywhere manifest throughout his career. Presumably, in Arabia whence he fled soon after discovering his ignoble origin, was obtained further wisdom, for the *Mysteries* of that country were already famed

* THERAPEUTIC GAZETTE, April, 1887, p. 235.

† Valmiki, in the Sanskrit poem "Ramâyanâ," tells us that colonists from Mayax in very remote ages took possession and settled a portion of the Indo-Chinese peninsula now known as the Deccan.

‡ Sacred Mysteries of Mayax, pp. 108, 114, 117, 121.

§ Ibid., pp. 123–125.

‖ Ibid., pp. 115–120.

¶ Ibid., p. 118.

** Here we have, perhaps, a clew to the theory of Angels, though in the main these spiritual beings seem to be derived from the *messengers* employed as go-betweens by the mythological deities of old: these messengers were in no sense themselves deities. (See Prof. W Robertson Smith's "Doctrine of the Angels," *Pop. Science Mo. Supplement*, No. 61, p. 514.)

†† *Mâ shâ* (Moses) in the Maya tongue means "From the *First Taken*,"—*i.e.*, drawn out of the water. It bears no evidence of being an original Hebrew word, and the history of the man is opposed to such supposition.

for their teachings in natural science; and here, undoubtedly, for a time he gave himself over to asceticism and meditation with a view of wiping away the "stain of blood" that was upon him, developing *ecstasia* more profound than that taught by the schools of Chemi, whereby were obtained visions like that of the "burning bush" described in Hebrew records.* Returning, he sought to relieve his people from degrading bondage, and with them found a government based upon the highest conceptions of the "*Supreme*" as taught in the sacred colleges, at the same time doing away with the esotericisms of the minor degrees and removing the debasing influence resulting from the teachings of apotheosis. The construction of the tabernacle with its appointments and "holy of holies;" the "ark of the covenant" with its deep signification; the limiting of high advancement to the members of his own tribe (subsequently a privilege that accrued to royal blood), and to individuals physically and mentally perfect (*Levit.* xxi. 17); the typifying the land to be seized upon and occupied, as that of *Can* (Canaan); the attempts to lift his followers to a higher plane morally and intellectually while inculcating implicit obedience,—whence the forty years spent in the "desert"; the laying of tithes or taxes; his individual knowledge of natural laws and of therapeutical, pharmacal, chemical, hygienical, and astronomical science; all exhibit the training of Heliopolis and Memphis, and stamp him as not only one of the most advanced of the "*Initiated*," but scientifically and politically one of the greatest men developed by any age or era.† Little wonder his name is revered by existing generations, or that at the court of Pharaoh he won the victory over the Magi who by their very caste and calling were limited in knowledge!

The sciences and arts that had the seal put upon their sepulchre in the murder of the beautiful and gifted Hypatia of Alexandria, daughter of Theon the mathematician, by the rabble following of Bishop Cyril, were already upon the wane in the time of the great "law-giver;" already the hermit colleges of Arabia ranked higher than the temples of the Nile Valley. The unity of the *Mysteries* had been weakened by secessions and subdivisions that, while lessening their value, opened the way for political trickery and individual ambitions, further fostered by the spread of the pernicious doctrine of apotheosis. The ranks of the *Mystai* received accessions from those who sought the guise of knowledge rather than true learning, and power rather than intellectual development, whereby the miraculous superseded the philosophic. The higher degrees were first neglected, then their divisions broken down by prostitution to the will of a political majority, and a few centuries later they had ceased to exist save in name, or had disappeared in the unknown regions of the farther Orient,—beyond the Caspian and the Persian Gulf,—there to linger and languish for lack of intellectual support and nourishment until the present hour. Brahmism, Buddhism, and Confucianism are the imperfect survivals, the two former retaining the fragments of an obscure psychism, the latter inculcating the subservience of all things to education and intellect. With a spasmodic uplifting and revival, the greater *Degrees* were partially and imperfectly restored to the Chemitic colleges, passed over into Greece and thence to Rome, only to return to Egypt in still further debauched condition, and to again retire to the fastnesses of Arabia, whence fragmentary portions came to us in later years by way of the Levant and Iberian Peninsula. The Greek and Roman Emperors, influenced on the one hand by the Christian Church,—that by the means taken to insure the spread of its doctrines received constant accessions from the ranks of the illiterate and vulgar,—on the other fearing the influence of the learned and wise, persecuted the latter even to death. For centuries knowledge was criminal; the exercise of reason and thought, treason and heresy;‡ and thus the last vestiges of the grandeur of the remaining *Mysteries* were crushed, and their esotericisms, lost to all true meaning, came to be embodied as part of religious creeds the better to satisfy the clamors of a superstitious populace;§ not the least of which in political bearing and import was the anthropomorphosis of *Isis*, or

* *Exodus*, iii. chap. It was long taught, as is yet the case among *Derwishes*, that to pass into a condition of *ecstasy* is a foretaste of absorption in or *union with* the Supreme. No religion is without ecstatic relations; to this hour we see it in orthodox "*revivals*" so called, in "*spirit circles*," and all forms of devoteeism.

† Ibid., chap. xxv. to xl.; xxx. 34–37; *Levit.* x. 9–10; Ibid., xi. to xxi.; *Deut.* iv.; Ibid., xiv.; *Exodus* xxii. 20; *et al.*

‡ Draper's "Conflict between Religion and Science," p. 60.

§ "The reign of Constantine marks the epoch of the transformation of Christianity from a religion into a political system," etc. Ibid., p. 52.

Mau (the apotheotized *Moo*), as *Maria* or Mary, the *Mother of God*.*

In Mayax, Egypt, Chaldea, India, and all ancient countries with pretensions to civilization, the acquisition of knowledge was made illicit save to those of the *Mysteries*, and thus, directly and indirectly, was fostered the principle of *caste*. Something of the same lingers even yet, and may be observed among primitive nomads, though they have advanced politically sufficient to recognize the value of bribes in removing otherwise insurmountable difficulties.† Garcilasso de la Vega informs us this was the case among the Shyris and Quichuas,—a statement that is corroborated by Bishop Landa as to the tribes of Mexico and Central America. While the *Mysteries*, in the main, were the privilege of birth and class, it was also possible, under conditions, for those of lower castes (females as well as males) to enter certain lesser or modified degrees, whence they might be advanced, if capable, by taking upon themselves the vows of sacerdotalism; but such candidates must needs exhibit special aptitude for the offices prescribed, and were tested in various ways by ordeals,‡ examinations, and appalling rites. Thus the real or active priesthood, more rapidly recruited, in time became the more influential and powerful factor, especially as standing in the gap between education and debased intelligence. Little wonder that the *Mysteries* degenerated and became prostituted to political power, for whoever runs may read that, in all ages and climes, among nations of high civilization as well as those steeped in the dregs of abject barbarism, the priestly class have ever arrogated to themselves special privileges because of their supposed familiarity with the Higher Presence,§ and also have jealously guarded their scientific and intellectual treasures from the vulgar by throwing about them the veil of superstition and mystery. In both the higher and lower *Mysteries* all discoveries, real or feigned, and all manifestations of thought and intelligence, were hidden beneath a cover of symbols the secret or esoteric significance of which could be penetrated only by the initiated,‖ while the common people were given such exoteric explanations as were conveniently plausible. This principle is yet adhered to by Buddhists, Brahmins, and Adepts; by the Christian Jesuits who profess to be the repositories of all knowledge, theological, philosophical, and therapeutical,—though in many ways inferior to some of their heathen prototypes; and by various secret organizations, including the different branches of Masonry, which itself is, in a sense, a survival of the *Mystikos Sekos*. With all, the secrecy for centuries upheld and still observed, is justly deemed the guarantee of honor, profit, and power.

It has before been remarked that the Sacred College embraced various orders and classes as well as degrees. Some of these led directly to the *Mâc*, or *Ephori*, as the Greeks were wont to denominate the highest perfection, which was the last step before reaching the degree that should entitle the aspirant to privilege of direct communication with the *Supreme*:¶ others were self-limited, having been instituted with special designs or purposes. There were others also not of the *Mysteries*, but *Mystical*; but these were of comparatively modern origin, and in the nature of extraneous religious worship, political and social organizations, or of the class of the *Saturnalia*.**

The first, taught the various branches of art, science, and philosophy, relatively and progressively, as a means of greater esoteric

* The *cross* from remote ages was an emblem of the *Mysteries*. The ancient astronomers of Mayax observed that at a certain period of the year, just at a time when their country otherwise would suffer from drouth, the rainy season was heralded by the *Southern Cross* appearing perpendicular to the southern horizon. This is our month of May, which owes its name to MAYA "*the good dame*," the "*mother of gods*." The cross was everywhere associated with water or rain, and the emblem of the goddess thereof (Mâya). This is why the Romish Church celebrates the feast of the *Exaltation of the Holy Cross* on the third day of the fifth month, which it has consecrated to the "*Mother of God*," "*our Good Lady*," the virgin *Mâ-R-iâ*, or the goddess *Isis*, anthropomorphosed by Bishop Cyril, of Alexandria. Isis was the sister of Osiris, therefore the Mayax *Moo* (also called Maya), being a dialectical mode of expressing the Mâya word *icin* ("*the sister*"). She is also termed *Mau*, and one of her titles, like *Moo*, was "*royal wife and sister*." (Appendix K.)

† THERAPEUTIC GAZETTE, April, 1887, p. 235.

‡ Ibid., pp. 235, 236.

§ Ibid., pp. 233, 234.

‖ Herein consists the mystery of the Bible and other ancient writings, and that is expressed by scholars under the name of "*Orientalisms*." The esotericisms of the Mysteries indelibly stamped themselves upon the languages of the East, and likewise are found exhibited in the speech of various nomadic races, including the aboriginal inhabitants of America.

¶ *Hâc-mâc* or *Lâb-mâc*, "The True," the "Very One," was the title of the high pontiffs of Quiche and Mayax, and the highest degree attainable in the ancient Central American *Mysteries*.

**Compare with the plan of the Church of Rome, from the Pope down to the lowest priest or acolyte!

understanding, and of nearer approach to the Supreme, Mysterious, and Occult—to Deity; in the second the knowledge acquired in the first was given the more practical bent necessary to satisfy the demands of utility.

In Mayax as well as the East, those who attained the "higher perfections" were to greater or less extent invested with supernal attributes in the eyes of their inferiors and of the vulgar, and there is little doubt they were more familiar with the secrets of Nature as manifested by the laws of psychism than any of the present age; perhaps also they may have had a more definite and thorough conception of Deity itself. Abdemonus the Tyrian, grand vizier to Hiram, would seem to have been one of these fortunate individuals, since the traditions of the Orient picture him as a *genie* in human form whose wisdom exceeded that of Solomon.

That the pre-historic as well as historic races of these ancient civilizations were not steeped in degraded bigotry, barbarism, and superstition; that their knowledge was not limited by a low and debased form of intellectuality; is made manifest by their records and by existing monuments. The evidences at command point out they were our superiors in art, architecture, mathematics, astronomy, and, to some extent, mechanics. Scarce anything of the present will endure like the mural paintings of Uxmal and Chichen-Itza, the sculptures of Thebes and Memphis, the rock decorations of Elephantis, or the walls of old Jerusalem; in China from time immemorial the mathematics so difficult to Latin and Anglo-Saxon races are the pastime of infancy and childhood; the pyramids and clepsydras of Yucatan and the Nile, and massive stone sextants, quadrants, and dials of India bear witness of exhaustive astronomical science, and we now know the form of the earth and its relations to the solar system had been defined and measured, and observations regarding eclipses, equinoxes, solstices, conjunctions of planets, and occultation of stars, recorded that but recently were deemed new; and when a French engineer caused to be engraved upon its pedestal the ponderous machinery invented to lift the Luxor obelisk to its place, a similar feat of engineering had been performed for its fellow in St. Petersburg and at the hands of a Trans-Caspian mujik with the simplest of appliances aided only by the traditions of his race! The *Troano* MS. would take high rank as a geological work in any age; the *Popol-Vuh* will compare favorably with any literature of its class, even the Apocalypse; and the fragmentary records of Assyria and Chaldea engrafted upon the Hebrew yet preserve their freshness and interest. Neither are there valid reasons for imagining the various branches that go to make up the science of medicine were all in the degraded and debased condition described by Hippocrates, whom it is the fashion to style the *Father of Medicine*, but with equal propriety might be termed the *Prince of Munchausens*, for it is now known the writings that bear his name are chiefly factitious, and not the product of any one pen or age. Moreover, the ancient authors who could impart the desired information, by the oaths exacted in the *Mysteries*, were forbidden to perpetuate their knowledge save in esoteric form—in parables.*

The discoveries in Yucatan and Central America are too recent to afford definite or precise knowledge regarding the therapeutics of the ancient races, save in their psycho-physical relations. With anatomy the edu-

* It is claimed by the Jews and supported by their traditions, that the founder of Christianity received his education in Egypt, whence he was carried to escape the jealousy of Herod, and there became familiar with the Mysteries and their doctrines. This would seem to have at least the basis of plausibility in that he taught by means of parables and enigmas, which was the language and method of the Colleges, and inculcated in his followers the communism and simplicity that obtained with the *Mystai* among themselves. (The primitive churches were communal, though not to the degree the term implies in our day.) That he was familiar with psychic influences as manifested by the phenomena popularly denominated *animal magnetism*, is apparent from the remark to which utterance was given at the time the woman "with an issue" sought to be healed by touching the "hem of his garment" (*Luke* viii. 46): "*Some one did touch me, for I perceived power had gone forth from me*" (also *Mark* v. 28–34). Again, his last words upon the cross, that have ever been a matter of puzzle and dispute to philologists (*Matt.* xxvii. 46), prove to be *pure Maya* with practically the same significance as given by John (xix. 30), or "*Finished; finished; and darkness is upon me*," or, "*will cover my face.*" We know the "Beloved Disciple" was of higher rank educationally than his colaborators, and hence would be more apt to understand the true meaning of the Mystic sentence, "*Eli, Eli; lama sabach thani*," that Matthew and Mark surmise to be an adjuration to *Elohim* (God); or more likely the sentence, "My God, my God, why hast thou forsaken me?" is an unauthorized interpolation, since *Eli* is the Græcized *Eloi* of the Armenian tongue. That foreign words survived in the *Mysteries* and were employed for certain esoteric purposes we have evidence in the *Kon-x Om Pan-x* that wound up the *Autopsia* and that has no meaning in Greek: also *Cansha Om Pansha* employed by the Brahmins to-day in the same sense as the Romish "*Ite missa est*," and to dismiss their assemblages. Both are apparently derived from the Maya vocables *Con-ex Omon Pan-ex*,—"Go forth, strangers; disperse."

cated orders and the priesthood must needs have been somewhat familiar, for embalming, both partial and complete, was practised. In the sculptures that detail the life of Prince Coh, the final picture of the tragedy is the preparation of his body for the funeral pyre; and by a transverse incision in the abdomen, directly beneath the xiphoid cartilage, had been removed the heart and viscera that were to be preserved, and that are exhibited in the hands of his relatives. Embalmment, here as in Egypt, presupposes extensive familiarity not only with the internal arrangements of the human economy, but also with aromatics, astringents, and antiseptics, and perhaps acids and chemicals; and a race accustomed to preparing and mixing colors for the purpose of adorning the walls of their palaces and temples, would scarce be so ignorant of the true values of articles of the mineral and vegetable kingdoms as to ascribe to them supernatural and diabolical virtues. Sculptures and pottery relating to the therapeutics of childbirth are quite common. The National Museum of Mexico is rich in these, and they exhibit a minuteness and fidelity of details that evidence extensive familiarity with the parts involved and their physiology; also with various abnormalities and presentations; with *massage* for correcting the position of the infant; with turning; manual expression, and mechanical aids and appliances for the removal of both child and placenta. In one instance the condition of a lady is expressed by a protuberant abdomen upon which is pictured the size and development of the fœtus, indicating that at the time of death she was some four months advanced in pregnancy, and the faithful delineation of the uterus and its contents would serve fairly well to illustrate the teachings of this period of gestation in our own day.

In the records of ancient Egypt we have even broader views of medical science. Glimpses are had of pharmacal and chemical knowledge; of shops for the compounding and sale of cosmetics, perfumes, "sweet unguents," and drugs; and we also are treated to pictures of gynecal, obstetrical, and surgical operations, including amputation, resection, and *trephining*. Syncellus informs us of the existence of a *Pharmacopeæ Chemi*, adding that ætites were employed for ascites and to procure abortion, *carbonate of lead* and *sulphate of copper* for soothing and astringent ointments respectively, that a solvent was known for renal and vesical calculi, and the crises and courses of fevers understood; also we surmise that the *nepenthe* of Homer given by the Theban queen to Helen of Troy to soothe her sorrows was a narcotic draught; and the same poet's description of the *Lotophagi* presupposes too great a familiarity and indulgence in opium or hashish.

There were also lower or subjective orders of priests and *Mystai*, by the Greeks termed *Pastophori*, whose duty it was to minister therapeutically to the needs of the common people and the military, and in return therefor derived an income from the public treasury. These were individuals of comparatively low origin, with mere smattering of education, who employed charms, amulets, and other psychic measures compatible with and attractive to the tastes of their beneficiaries. Moreover, they were obliged to confine themselves, each to a special form or class of diseases, for a stated number of days implicitly following the routine* prescribed by the Sacred College or the chief of their order, ere innovations could be made. Under such circumstances we are not surprised to learn that progress was slow among this class of practitioners, or that officers of rank frequently themselves sought to alleviate the sufferings of those under their command.

But, because the masses were wedded to ignorance and superstition carefully fostered by the dominant classes, we have no precedent for believing the *Initiated* were steeped to the lips in gross fetichism, or that therapeutics, as commonly asserted, were "no more than absurd worships rendered different divinities." Are the masses representatives of the education and refinement of our modern civilization, or are they free from charlatanism, superstition, and miracle-worship? Was the symbol of *Thoth* or *Osiris* worn suspended from the neck more absurd than texts from *Scripture* now advocated and employed by the exponents of "The Divine Art of Christian Healing,"† or the bits of "blessed Eucharist," medals of Virgins or Saints, or—better yet—the "black cat's skin-poultice" ordered by a regular physician at the request of the wife of a United States

* The Mysteries rigidly enforced their rules. We see this in the Hebrew *Law*, and again in a study of the public art of Egypt, where everything was built and chiselled on precise scales, and by the same esoteric rules and lines. In private art, however, we find notable exceptions, and evidences of the discard of canonic and mathematic idealization in the interest of truth: for instance, the fragment in the museum at Boulac that has been dubbed "The Schoolmaster,"—"an undeniable portrait." (Reber's "Art," p. 41.)

† *Century*, July, 1887.

Senator to relieve *globus hystericus?* Does the bulk of the clergy of the nineteenth century represent the advanced thought and education of their calling, or do the multitude of practitioners evince skill in pathology, physiology, or therapeutics? The learned of Egypt did not often exercise their skill save among their own degree and caste; and with such a civilization, even though knowledge was esoteric and privileged, there must needs have been considerable progress in medicine and therapeutics, since both are, in a sense, contemporary with man's reclamation. The pity is that we cannot penetrate the secrets of the past to determine the heights to which they had risen. That medicine was a long way removed from superstition and occultation is evidenced by the fact that seven books devoted to this subject were part of the properties of the temples, six of which, including a treatise upon the *Eye*, were ascribed to Thoth, the preceptor of Isis, the other, an exhaustive work on Anatomy, from the pen of Athothems II.; and these volumes were so complete that no one man within the limits of public usefulness could master them all, for which reason the *Pastophori* were restricted to special walks of professional life.* Again, it is recorded that one of the Ptolemies devoted his leisure to comparative anatomy and physiology, performing dissections under his own hand; and at a later period a school of practical anatomy was founded at Alexandria. Wunderbar, after carefully weighing all the evidences, declares the higher *Mystai* were physicians of "rich cultivation and attainments;" and that this was the impression abroad, appears from the request of Cyrus that an Egyptian *Oculist* be sent to the court of Persia. At this time it also was the custom, in all parts of the world, in all matters of Life and Philosophy, to seek counsel of wise men who were chance visitors from other countries.

Among the early Hindus six books† were cherished corresponding to those of Thoth in Egypt, and a seventh, *Bajikarana*, of later date, and sometimes deemed spurious or apocryphal to the *Mysteries*. These constitute the *Agur-Veda*, which Sir William Jones, after cursory examination, further hampered by lack of practical familiarity with Sanskrit, pronounced mere empirical histories of diseases and their remedies. But this criticism may or may not be just, since the key to their esotericisms is probably lost; and to-day it is practically impossible, for the same reason, to obtain parallel interpretations of the Hebrew and Greek Scriptures. The *Shastra* teaches each form of life contains within itself certain elements, the relations of which one to another cannot be disturbed with impunity, and whence the ultimate conclusion that all diseases are the manifestations of increase or diminution of such elements, whereby is established the preponderance of one or more to the exclusion of others. Who will definitely criticise such physiology, or decide exactly how far it is right or wrong?

The native therapeutists to-day, especially among the lower *castes*, are represented by mountebanks,—dealers in amulets, charms, and sham esotericisms. It is not at all strange, however, considering the vicissitudes by war, rapine, bloodshed, and famine, that in rapid succession have overtaken the Indo-Chinese peninsula, that the education of the *Mysteries* has practically vanished, the little remaining being a literature that, while it commands our admiration, conveys little of its true meanings; or that the inhabitants have reverted to a primitive and demoniacal system of philosophy, and the Fakir (*Pastophori*), hurried on by the greed that is inherent to all the human family, has fallen to the low estate of the original *Sham*.

In all matters that are not distinct historic records we are accustomed to accept the prejudices of the Greeks and Hebrews, and deny the peoples whose civilizations were a reproach to these two nations the exercise of the commonest intelligence. Neither the Hellenes nor the Jews ever builded so massively or grandly as those of Petra, Assyria, Persia, Arabia, Hyrcania, etc., that—following example—we are wont to term "*Barbarians*." Herodotus is cited as authority that Chaldea and Persia were destitute of therapeutic talent because it was the custom to expose the "ill and afflicted upon the market-places" in the hope some one might take pity thereupon, and because on certain historical occasions physicians were summoned

* Says Surgeon-General Charles A. Gordon of the *Horse Guards*, who has paid considerable attention to anthropological medicine, "The art of healing in Egypt had evidently attained a recognized position prior to 2717 B.C.; and in the '*Papyrus Ebers*' there is evidence that knowledge of the treatment of disease was more advanced than in the time of Galen, or the second century of our era!"

† The "Salya" and "Salakya" were devoted to traumatic and organic surgery; the "Kaya-Chiketsa," to practical medicine and therapeutics; "Bhutaridaya," to mental phenomena and diseases; "Kaumara-Bhritya," to diseases of women and children; "Rosayana," to chemistry; "Bajikarana," to sexuality and the increase of the human race.

from the banks of the Nile or the hills of Attica. But in either case the record is imperfect, and, moreover, it is doubtful if its author ever intended such interpretation should be placed upon it. The exposure of the pauper ill to public gaze on the market and in the vicinity of the caravansaries, for the selfsame reason, is yet a custom of the Orient.* It is in the hope they may attract the attention of some learned and travelled wise man, or *derwish*, who will bestow his services gratuitously; and a foreign *Hadji* is always in greater repute, no matter how apparent his imposture, than the skilled wisdom of local talent. We know there were Hebrews who were *Ephori* in Babylon, the Ecbatanas, Persepolis, and Nineveh; likewise Magi, who were capable of ministering to those of their own caste. Xenophon† declares that Cyrus "got the best physicians about him," and "whatever instruments and medicines were needed," and that he was "grateful" for their services, and "spared no expense" in their education; and it is not at all probable the whole empire, or even its army, was at the mercy of foreign hirelings. Finally, the summoning of experts from abroad, without more specific evidence, is entitled to no more consideration or comment than accrues to the same in the present decade.

The Children of Israel, deriving their civilization from the banks of the Nile, closely followed the teachings and precepts of the Chemitic colleges. The masses of Egypt, crushed by the weight of ignorance and misery, then as now passed their lives in filth and brutality. Moses, from the very outset of his political career, however, sought to lift *all* his countrymen to a higher level of intelligence and morals, and unite by the broad bond of community of purpose and thought. With this view the lesser *Mysteries* were thrown open and their esotericisms made public; woman was lifted to a higher plane socially than was known in Egypt, save among the noble classes; virtue, temperance, thrift, chastity, cleanliness, and obedience were inculcated, along with statutes manifestly derived from close contemplation and study of natural laws and objects, such as were known only to those familiar with the inner courts of Hieropolis and Memphis; and all were made imperative as being specific acts, released from the veil by command of the *Supreme Intelligence*, who thus sought to draw a "favored race" nearer to Him.

It must necessarily be granted that the great "*law-giver*" who had penetrated the secrets of nature as taught by the highest *Mysteries*, and who was deeply versed in the laws of hygiene and prophylaxis,‡ could not have been wholly ignorant of therapeutics, for among the rudest peoples, if at all progressive, remedies selected at random through some supposed esoteric or spiritual influence, by empirical application must lead, ultimately, to increased and specific knowledge. Prejudiced by the precarious and uncertain information afforded by history that at its best is but skeletal, we ignore the deeper and relative meanings of the *Talmud*, *Mishna*, and *Scriptures*. Turn to the former, and in the treatise termed *Chulin* discover a detailed description of the pathological conditions indicative of disease in animals designed as food, including *trichinosis*. In *Leviticus* and *Deuteronomy* note the directions for preserving individual and public health; the selection of portions of creatures for sacrifice, and rejection of those organs of the economy whose functions are the removal of impurities or excretion; the disposal of filth, that it may contaminate neither air nor water; the disposal of the dead; disinfection and purification of clothing and dwellings and the laws of quarantine;—all of which indicate deep physiological and pathological knowledge. Will any one presume to say that the human race—male and female—would not be materially improved both as to health and morals if the Mosaic law was rigidly enforced to-day?

Moses, we read, prepared ointment according to the "apothecaries' art," and apparently he possessed considerable familiarity with chemistry and metallurgy.§ Solomon speaks of the "powders of the merchant,"‖ proving that a distinct trade was carried on in pharmaceutical products; and in one instance we find a prescription in due form.¶ Again, Moses, Elisha, Daniel, Balaam, and others give evidence of skill in *ecstasia*, *psychomancy*, *clairvoyance*, etc., and the first three manifestly were adepts in the art of appealing to the nerve-centres through the medium of the senses. Solomon was undoubtedly familiar with zoological and anatomical science, skilled

* See second paragraph preceding; also THERAPEUTIC GAZETTE, May, 1887, last foot-note on p. 305.

† Institutes of Cyrus, book viii.

‡ *Leviticus*, iv. to xxvi. chaps.

§ *Exod.* xxiv. 20; xxx. 35; *Proverbs* xxv. 20; *Jeremiah* ii. 22.

‖ *Canticles*, or *Song of Solomon*, iii. 6; also "*The Wisdom of Solomon.*"

¶ *Exod.* xxx. 23–25.

in the arts, and conversant with the laws of heredity, besides possessing knowledge of therapy. Josephus mentions his ability to "expel sicknesses."* His reputation for the production of psychophysical phenomena, and as one of the highest of the *Mystai*, is the theme of Eastern story; and from all accounts he should have had some slight knowledge regarding *women*. And we read that King Asa, when his disease was great, "sought not the Lord,"—*i.e.*, the privileges of the higher Mysteries to which his rank entitled him,—"but the physicians," or Jewish *Pastophori*.

The *Talmud* affords glimpses of a somewhat extensive pharmacopœia, including, as it does, decoctions, draughts, infusions, wines, vinegars, syrups, oxymels, essences, mixtures, liniments, cataplasms, blisters, ointments, electuaries, clysters, plasters, powders; also cathartics, emetics, tonics, sudorifics, expectorants, pyretics, tonics, abortives, soporifics, hæmostatics, astringents, poultices, and depilatories. The following substances receive individual mention in connection therewith: water, wine, beer, vinegar, honey, whey, milk; oils of opobalsamum, myrrh, rose, palmi-christi, cotton-seed, walnut, sesamum, colocynth, fish; figs, dates, melons, apples, pomegranates, pistachio-nuts, almonds, pitch (bitumen), also all grains; leeks, onions, garlic, beets, mustard, pepper, coriander-seed, ginger, cummin, beside various herbs steeped in oil and wine; eggs, salt, suet, wax, fish-gall, ox-gall, ashes, cow-dung, pigeon-dung, bats' blood and droppings, and the droppings of sheep and fowls, *album græcum*, urine, "fasting-saliva;" calamus, aloes, myrrh, frankincense, myrtle, endive, mint, anise, fennel, cotton-plant, lily-roots, madder, narcissus, wormwood, jessamine, laurel, clover root and tops, jujube, hyssop, thyme, fern, milk-thistle, broom, juniper, poppy, acacia, pine, lavender, rosemary, saffron, madragordia, cinnamon, canella, cassia, spikenard, styrax, mandrake, *mentha gentilis*, *alhenna*, *sampsuchum*, *euraca maralis*, *ladanum*, *galbanum*, *blatta byzantium*, *ammeisision*, pyrethrum, musk; ætites, mercury, soda, litharge, borax, alum, clay, iron, copper, lead, yellow arsenic, bitumen, and *theriaca*. Certainly no very disreputable showing.

Wunderbar enumerates from the *Mishna* and *Talmud* no less than fifty-six forms of surgical instruments and appliances, exclusive of the obstetric stool referred to in *Exod.* i. 16, and again in 2 *Kings* xix. 3. But surgery ranked less high than medicine by reason of being deemed a *mechanical* accomplishment, and, as is yet the rule in the East, united with it the profession of barber, and in Egypt, oftentimes, that of embalmer. The statement so frequently made that the ancients imagined the heart increased in size until the fifty-sixth year, and then slowly atrophied until death claimed its victim, must be taken cautiously. It was probably a figurative expression having reference to man's liberality, and not to a supposed anatomical feature, whatever may have been the construction placed upon it by the vulgar. The same is also true regarding a nerve extending from the ring finger to the heart.†

Medicine early declined among the sons of Jacob. It is doubtful if it ever reached higher perfection than at the time of Moses; certainly not after Solomon. From the reign of the "wise king" the decay of the race as a political factor has been steady. The heredity of nomadism has never been wiped out. While individually giving evidence of high intellectuality and capable of reaching any goal, the masses of the Hebrews, especially of the far East, are less civilized than at the time of the Exodus. Jewish physicians, however, among all nations, have ever taken high rank, and to-day it is rare to find one in the midst of civilization who is not an able physiologist, pathologist, and therapeutist, or who is not well informed in all collateral branches and sciences.

APPENDIX.

K.

Undoubtedly the story of Abel as it appears in *Genesis* was derived from the history of Osiris through Chaldaic sources, alterations having been made to preserve the mysticisms of the sacred colleges; for those acquainted with the truth as obtained through the *twelve* degrees would only give such exoteric explanations thereof as might suit their purpose or convenience. It is for this reason that so little is learned from ancient writings and authors: herein consists the mystery of the *Scriptures;* and this is why Herodotus, confessedly one of the *Initiated*, excuses himself for lack of explicitness; and Plutarch in his "Osiride et Iside" only purports to give such explanation as will satisfy certain of the inferior *Mystai*.

* Ant. viii. 2.

† This has been confused with the little finger by some authors, which had a specific office prescribed to it in the pouring out of libations. It was the *ring* finger of the *left* hand that was supposed to be *nearest the heart*, and it was for this reason the *third* finger of the *left* hand was chosen to carry the marriage circlet—a superstition that yet obtains as custom in our own day.

The Hebrew (non-scriptural) tradition is that Abel and Câin each had a twin-sister, and that Adâm proposed to give the elder daughter to the younger son, and the younger daughter to the elder son, in marriage. This was every way agreeable to the first-mentioned couple, who had conceived a deep affection one for the other; but unfortunately the elder brother had fallen in love with his twin, she being the more beautiful of the sisters; hence the tragedy.

Osiris, who was the culture hero of Egypt, espoused his royal sister Isis or Mau, and fell a victim to the jealousy of his brother Set, or Typho. A similar tale is found in the Sanskrit "Ramayana," the victim being Bâli, his murderer Sougrivâ; and the recital is so nearly identical with that archived in the sculptures and paintings of Uxmal and Chichen-Itza, and recorded in the second part of the *Troano* MS., that it is more than probable it was imported from Yucatan direct, perhaps by the colonists who, as Valmiki (the author of the "Ramayana") tells us, settled in the Indio-Chinese peninsula (the Deccan) in remote ages, and who naturally would bring with them the language, customs, traditions, civilization, and folk-lore of their native land.

The Mayax history as it appears upon the walls of various cities of Central America, according to Le Plongeon, is substantially as follows: Câin (the *serpent*), the founder or restorer (*Ahdama*) of the ancient empire of Mayax, possessed three sons and three daughters, respectively named Cây (*fish*), Aâc (*turtle*), Coh (*leopard*), Moo or Mau (*macaw*), and Nicté (*flower*). As was subsequently the case in Egypt, Ethiopia, Mesopotamia, and other countries, the law of the land demanded the youngest son should espouse the eldest daughter in order to insure legitimate and divine descent; so Moo became the wife of Coh, greatly to the satisfaction of both. Aâc, however, was deeply enamoured of Moo, and sought her hand in defiance of law and custom; moreover, he was deeply jealous of Coh, because of the latter's popularity, and fame as a warrior and huntsman.

With the death of Câin Ahdama, Uxmal, the "Land of the Sun," fell to Aâc, and Chichen-Itza, "Land of the Serpent," to Moo, who shared the sovereignty with Coh; Cây being High Pontiff of Mayax was not eligible to the throne. Immediately Aâc began plotting to seize the whole kingdom; and finally, after an altercation with Coh, satiated his jealousy by three spear-thrusts in the back of the latter. The country was now thrown into all the horrors of civil war, though Aâc, who was more of a diplomat than a warrior, soon made proposals for the hand of Moo. This tableau represents Moo seated in her house in the midst of a garden, at her feet a basket of oranges ("golden apples"), her hand stretched forth indignantly, spurning the gift, and warning away the supplicating messenger; Aâc is seen on a lower plane making obeisance, while overhead his royal totem, a *serpent*, ogles the macaw perched in the tree above Moo.

Here we have the explanation of the "Temptation," the "serpent," the "apple," and the cause of the fratricidal strife. A basket of oranges is to-day the means employed by the Mayas for conveying an offer of marriage; the serpent was the royal insignia of Aâc as a sovereign, though his individual totem was a turtle; and the whole, whether found in *Genesis*, the "Ramayana," in the *papyri* of Egypt, or in the legend of Kronos of Atlantis, is merely the feud of the children of Câin I. that, passing from mouth to mouth, generation to generation, and country to country, has in some instances suffered slight disfigurement, probably at the hands of those who were not accustomed to hold woman in the same high veneration that pertained to the sex in Mayax. In Yucatan only is found the narrative as part of the history of a nation; here alone have been discovered the portraits of the actors, the ornaments and weapons they wore, their tombs, and the embalmed and cremated remains of their mortality. Who can doubt the identity of Câin and Zoç with the Chaldeo-Hebrew Adâm and Eve, or Chemitic Seb and Nut; or of Cain, Abel, Enos, and sisters with Aâc, Coh, Cây, Moo, and Nicté, and the Egyptian Set, Osiris, Aroeris, Isis or Mau, and Niké; or that *Sougrivâ* is merely a Hindu Aâc, and *Bâli*, Coh! Even the names in each account are synonymous. No one familiar with philology can deny that A-bêl—A-bâl—Bâl-*i*—Bâl *âm* are identical words. *A*, the contraction of *Ah*, is the Maya masculine article *the*; *Bâl* is the radical of Bâl-*âm*, and Bâlâm is for the people of Yucatan to-day the *Yumil-Kaax*, "Lord of the Fields," or "Leopard," the title and totem of the unfortunate Coh. In Egypt the leopard's skin was always a part of the ceremonial dress of priests; in Greece and Chaldea it appears as an appendage of the Mysteries; it was worn by Nimrod and Bacchus, two prototypes of the murdered Prince, and invariably hung suspended from the altars and shrines of Osiris; and when the latter appeared as sovereign lord of Amenti, or the "*Land of the West*," his symbol was a leopard reclining beneath an open eye. *A crouching leopard with human head, the ear tablets of which bear the name of Coh, has recently been unearthed among the ruins of Chichen!* Again, the leopard's skin is mentioned by the Brahmins in connection with the prayers of *Aytâreyâ Brâhmânâ*, and employed in the *âgnishtomâ* of the Soma Mysteries to envelop the neophyte who is to be "*born again*," and "*out of which he emerges as from his mother's womb*." (By comparing with Appendix N further clew may be had to the esotericisms of both the Old and New Testaments.) Osiris or Osir appears to be derived from the Maya verb *Ozil*, equivalent to "dearly beloved," a title that often accrued to Coh because of the love borne him by his sisters, and that manifested by the people generally whose hero he was.

Câin, Set, Sougrivâ, and Aâc are all expressive of the individual. The first is derived from *Cân*, the title of Maya rulers and also of the rulers of Central Asia from Burmah to Thibet to this day (*Khân*). Set is the cognate of the Maya *Ze*, "to abuse with blows," an appropriate title for one who murdered his two brothers with strokes of a spear, and when the fortune of war placed his sister Moo in his power, first violated her, then kicked her to death, as is the account given by the *Troano* MS., and Aâc's palace in Uxmal represents him with the heads of Coh, Cây, and Moo at his belt, and their flayed bodies at his feet. Sougrivâ is made up of three Maya primitives, *zuc* ("quietly"), *iib* ("to ascend"), and *hâ* ("from water"), the *turtle*, in fact. Set, for his crimes, in Egypt was denominated *Nubti*, an Evil principle, or, according to the Maya language, the "*Adversary*."

L.

From time immemorial the Egyptian priests carefully preserved among the archives of the temples and sacred colleges faithful accounts of all events deemed worthy of a place in history. They derided the Greek philosophers for their belief in the universality of the deluge of Deucalion, averring there had been several local

catastrophes of like nature. When Solon sought the wisdom of the temples of Delta, he was told that the greatest cataclysm ever known resulted in the destruction of a continent lying off the Pillars of Hercules (Gibraltar), in the Western Ocean, as the sequel "to violent earthquakes and deluges (tidal waves), which brought desolation in a day and a night," when "the land was plunged beneath the sea and entirely disappeared." They placed this event at nine thousand years before the date of narration, or somewhere about ten thousand years before our era. Not only does the same account appear in the *Troano*, but it is also carved in intaglio over the interior door-way of the rooms of the sacred college at Chichen, and specified as *Akâb-ib*, or the "terrible writing." It is not improbable that it was the fate of Atlantis that gave rise to the Chaldean, Chinese, Aryan, Greek, and Polynesian traditions of a deluge, and the narrations of the Sibylline and Phœnician oracles. Rev. Dr. McClintock justly remarks that the curious coincidence between the traditions of the two hemispheres is "explicable only on the hypothesis of some common centre." (See "Biblical, Ecclesiastical, and Theological Cyclopædia," vol. ii. p. 732, *et seq.*) That the peoples of the East had found the means of communicating with the present continents of America long before the time of Columbus or the Norse adventurers is evident from the fact that "*black people*" existed at and about the Isthmus of Panama at the time of the first arrival of the Spaniards; and portraits of such have been discovered in Uxmal, Ake, Chichen, Tula, and Teotihuacean.

M.

A sole and omnipotent Deity, the Creator of All Things, appears to have been the universal belief of the earliest ages. This the Chemitic priests termed *Kneph*, placing superior to the Triads. In Chaldea, "daughter of *Posidon*, king of 'Lands beyond the Sea,'" in spite of the apparent polytheistic character of religion, a Supreme was recognized as *Kâ*, "the eternal truth" (*Lâ* of the Mayas), to which also a trinity was subjective. The "Niroukta," one of the sacred books of the Hindus, declared there were "three gods" that, however, "designate but one deity,—*Maha-atma*,—Soul of Souls." Tao-Tse, a contemporary of Confucius, wrote, "Reason produced *One;* one produced *Two;* and both produced *Three*." Again, among ancient Peruvians, *Pâcha-câmâc* was designated as the head of a trinity composed of Himself, *Con*, and *Uiracochâ;* and the Quiches declared all things existed by reason of *Tzâkol*, whose names are *Bitol*, *Alom*, and *Qaholm*,—the "Constructor," the "Engenderer," and the "Giver of Life."

These conceptions concerning a triune Deity, preserved in the works of the early philosophers, have descended to the present, but we nowhere learn their precise origin. If the ancient priests knew, they carefully concealed the fact; and the "Fathers" of the Church manifestly were equally in the dark, being satisfied with appropriating as an unfathomable mystery, and imposing as a dogma. (See Draper's "*Conflict of Religion and Science*," p. 53.) Indeed, so little was the subject understood that for a time it was a wrangle who should be named as the least and last of the triad, the Virgin Mary having a numerous and influential support. ("Bib. Theolog. and Eccles. Cyclopædia.")

The conception of the Creation that obtained among the ancient people of Mayax is well told in a tableau sculptured on the east façade of the palace at Chichen. It represents a luminous egg, emitting rays and floating in the midst of the waters where it had been deposited by the Supreme Intelligence. In the egg is seated the Creator, his body painted blue, in his hand a sceptre, a plume of feathers surmounting his head, and his loins wound with a broad falling girdle; he is surrounded by a serpent, symbol of the Universe. Porphyrus's account of the Orphic *Mysteries* would serve as an explanation to this. To the initiated, Jupiter is represented "as a man *seated*, alluding to his immutable essence; the *upper part of the body naked*, because it is in the skies the Universe is most uncovered; *clothed from the waist below*, because terrestrial things are most hidden; *with a sceptre in his left hand*, because the heart is on that side and the organ that regulates the life of man." Says M. Le Plongeon, "The philosophers of Mayax probably knew the waters covered three-fifths of the globe, and that water being a combination of gases, the most subtle of fluids, must have been the first form of matter produced. This is why, on each side and on the top of the tableau, they placed the symbol of water, taking care to leave without it, at the upper part, a portion equal to *two-fifths* of its length. In the midst of the waters they represented the figure of an egg, because their study of physiology had made them acquainted with the fact no being exists on Earth that is not born from an egg. The egg emits rays of light into which, says Thoth, 'all things resolve themselves,' and that, says the *Popol Vuh*, 'appeared on the water as an increasing brightness that bathed the Creator.' Notice also that the symbols of water terminate with the head of serpents, because they compared the waves of the ocean to the undulations of the reptile's body while in motion. For this reason the Mayas named the sea *Cânâh* the great, the powerful serpent; and in the *Troano* the sea is always designated as a serpent's head. This explains why the Mayas, Quiches, Egyptians, Hindus, etc., represented the world, and by extension the maker of it, as a serpent. Thus it is that they placed a serpent within the egg, behind the Creator, to indicate this symbol is the totem of the ancestor of all beings. And here we have one of the origins of serpent worship,—that is, adoration of the Creator." The Egyptians called the creative power *Kneph*, from *Kânch*, a cognate of Can-hel (serpent), and said he threw from his mouth an egg in which was another god, *Phthâ*. Phthâ, or *Thâh*, in Maya signifies the "worker," hence maker or creator.

Either the Maya, Quiche, or Egyptian account might be accepted as a translation from the "Manava Dharma Sastra," a book compiled from other and more ancient works of the Brahmins, somewhere about 1300 B.C. (H. T. Colebrook). This work further declares, "In the beginning was nothing but darkness. Then the great self-existing Power dispelled the darkness and appeared in all his splendor. He first produced the waters, and on them moved *Narayana* the divine spirit." Compare this with *Genesis* i. 1–4. Then with the Chaldean account, "In the beginning all was darkness and water; and therein was generated. . . . animals and . . . forms. Thalath ruleth them all." (The Chaldee *Thâlâth* (woman), Greek *Thâlâssâ* (sea), is the Maya *Thâllâc*, "thing without steadiness.") The Hermitic version is, "There was boundless darkness, and water and a subtle spirit, intellectual in power, existing in chaos. But the holy light broke forth, and the elements were produced from a watery essence." The

Chemitic record declares, "All things had resolved themselves into light . . . the earth nowhere appeared" (Primander). And the Quiche, "Everything was without life, calm and silent; . . . void was over the immensity of the heavens . . . only the tranquil sea was, and the space of the heavens. All was mobility and silence and darkness; only the Creator, the Maker, the Dominator—the Serpent—they who engender, they who create, were on the waters as an ever-increasing light."

Whatever may be the view taken of the subject, it can hardly be argued that this identity of ideas is purely accidental.

N.

The following extracts are adapted from "Sacred Mysteries of the Mayas and Quiches":

Book of Enoch: "A spacious habitation built with stones of crystal. The roof had the appearance of agitating stars, and flashes of lightning. Flames burned about its walls, its portals blazed with fire. The dwelling was hot as fire,—cold as ice. . . . Then I went to another habitation, more spacious than the former. Every entrance which was opened before me was erected in the midst of a vibrating flame. . . . Its floor was on fire; above were lightnings and agitating stars, whilst its roof exhibited a blazing fire. . . . One of great glory sat upon the orb of the brilliant sun. . . . A fire of great extent continued to rise before him. (Chap. xiv. ver. 12, 14, 18, 24.) . . . They raised me up into a certain place where there was the appearance of burning fire; and when they pleased, they assumed the likeness of men. . . . And I beheld the receptacles of light and thunder at the extremities of the place. There was a bow of fire, and arrows in their quivers . . . a sword of fire, and every species of lightning. (Chap. xvii. ver. 1–3.) . . . Then I passed into another terrific place . . . where I beheld the operation of a great fire, blazing and glistening in the midst of which there was a division . . . columns of fire struggled together to the end of the abyss, and deep was their descent. . . . This was the place of suffering. (Chap. xxi. ver. 4, 5, 6.) From thence I proceeded to another spot, where I saw on the West a great and lofty mountain; a strong rock, and four delightful places." (Chap. xxii.)

Again, Henoch gives us an elaborate account of how, with the help of his son Mathusaleth he constructed a dwelling deep in the bowels of a mountain in the land of Cânaan, in imitation of the nine vaults shown him by Deity, each apartment being roofed with an arch, the apex forming a keystone, upon which were engraved mirific characters, each of the nine letters representing one of the nine words emblematic of the nine attributes of God. He then constructed two triangles of pure gold, tracing on each two of the mysterious characters; one of these was suspended within the deepest arch, the other given to Mathusaleth, to whom he imparted "*important secrets.*" Note that all this is in consonance with the esoteric rules and teachings of the Mysteries, and that the structure corresponds to the plan and architecture of the temples of Yucatan and the Nile.

The initiation at *Xibâlbâ*, in the heart of the mountains of Guatemala, consisted of seven ordeals, according to the *Popol Vuh:* 1. Crossing the rivers of *mud*, followed by that of *blood;* journeying the *white, red, green,* and *black* roads, and the salutation of the twelve veiled *Mystai;* the detection of the false or dummy *Mystikos* in their midst; the scorching that accrued to those who ventured to recline in the presence of the august assemblage when so invited, the seat being a hot stone. 2. The "Dark House," where for the space of a night a lighted torch must be maintained, yet returned whole at the termination of the ordeal; terrible chastisement, even death, in each instance awaited those who failed. 3. The "House of Spears," where for twelve hours the candidate was obliged to defend himself from the attacks of an expert spearman; and also to provide four pots of rare flowers without outside communication, or bringing with him. 4. The "House of Ice," where the cold was intense, yet had to be borne from darkness until daylight. 5. The "House of Tigers." 6. The "Fire House," a burning furnace, the heat of which must be borne from sunset to sunrise. 7. The "House of Bats," full of death-dealing weapons, and the dwelling of *Camazotz*, the Cheiropteran god, who appeared and beheaded the candidates if off their guard.

"Do not the terrors of Xibâlbâ recall the visions of *Henoch?*"—remarks Doctor Le Plongeon,—"The blazing house of crystal, burning hot and icy cold—that place where were the bow of fire, the quiver of arrows, the sword of fire—that other where he had to cross the babbling stream, and the river of fire—and those extremities of the earth full of all kinds of huge beasts and birds—or the habitation where appeared one of great glory sitting upon the orb of the sun—and lastly, does not the tamarind-tree in the midst of the earth that he was told was the Tree of Knowledge, find its simile in the calabash-tree in the middle of the road, where those of Xibâlbâ placed the head of Hunhun Appu after sacrificing him for having failed to support the first trial of the initiation? Even the title—*Hâch-mâc*—of the high priest in Mayax, that we see over the bust of High Pontiff Prince *Cây Cânchi*, son of King *Cân* at Uxmal, recalls that of the chief of the Magi at Babylon. Do not also the awful ordeals of Xibâlbâ seem an exact counterpart of what happened in milder form at the initiation of Eleusis or the greater Mysteries of Egypt from which they were copied? Does not the recital . . . recall to mind the wonderful similar feats said to be performed by the *Mâhâ-âtmas* in India, and of several of the passages of the book of Daniel, who had been initiated to the mysteries of the Chaldean Magi? Will it be said that the Mysteries were imported from Egypt, Chaldea, India, or Phœnicia to America? Then I will ask when? By whom? What facts can be adduced to sustain such assertion? Why should the words (*Con-ex Omon Pân-ex*) with which the priest at the conclusion of the ceremonies of Eleusis, and the Brahmins at the end of their religious ceremonies, dismiss the attendants, be *Mâya* instead of Greek or Sanskrit?"

Port Huron, Michigan.

A CONVENIENT FORMULA FOR THE TREATMENT OF DIABETES BY LITHIUM IN PILL FORM.

Vigier recommends the following as more convenient than Martineau's arsenical liquid containing lithium:

℞ Lithii carbonat., gr. iss;
Sodii arseniat., gr. $\frac{1}{25}$;
Ext. gentian, gr. $\frac{2}{3}$;
For each pill.

To be taken morning and night, and continued until sugar has disappeared from the urine.

The Therapeutic Gazette

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Leading Articles.

THE DANGERS OF ANTIPYRIN.

IT has almost seemed as if history was repeating itself in the case of antipyrin. Like all other drugs enthusiastically received by the profession, and in many cases truly unworthy of the recommendation that they have received, antipyrin is only now, several years after its introduction, commencing to show its disadvantageous side in a stronger light. Scarcely a journal comes before us which does not contain some mention of the unfavorable results which have followed the use of antipyrin. In addition to the fatal case referred to in the GAZETTE for 1885, p. 257, we have recently seen a record of at least one death produced by its use, although the authority for that statement has escaped our memory, innumerable cases where untoward results have been produced, and several cases where cyanosis, vomiting, disturbed respiration and circulation have followed doses which, in other circumstances, have been administered with impunity. Guttmann, to whom especially we are indebted for a great deal of valuable information as to the action and indications for the use of this drug, in the *Therapeutische Monatshefte*, June, 1887, calls attention to two striking cases, in which, in his own experience, alarming results followed the use of antipyrin. Numerous cases are on record where collapse has followed the use of antipyrin in doses of 45 or 30 grains,—the doses recommended by Filenhe, its discoverer,—but in one of these cases of Guttmann's, in a few minutes after the administration of a dose of *15 grains*, cyanosis of the face, increased respiration and pulse-frequency, dyspnœa, and sensations of extreme heat over the entire body, made their appearance. In a few hours these symptoms had disappeared under the internal use of camphor, and applications of mustard over the breast and calves of the legs and an ice-bladder over the heart. In another case similar appearances came on after the same dose, with the addition of œdema of the arms and hands,—symptoms which, in spite of treatment, continued for three days.

Without attempting to give the statistics of similar cases, which we do not doubt have come before the attention of all readers of medical journals,—and perhaps the experience of most practising physicians is not free from such unfavorable results,—it does not follow that antipyrin is necessarily in danger of losing its prominent position. As is well known, most of our powerful remedies are found, in certain individuals, productive of the most serious results after the administration of the smallest doses. Such idiosyncrasies are frequently met with, and our desire is only to attract attention to the fact that antipyrin cannot be administered to every one in the usual doses with impunity. These idiosyncrasies can only be guarded against by the most extreme care in the commencement of the use of any drug. We would therefore recommend that wherever antipyrin is used for the first time the dose should never exceed 10 grains (and perhaps even 7½ would be better) until it has been found that no serious action follows its use. In fact, it is very doubtful to our mind whether the dose should ever exceed 10 grains, since common experience seems to show that the reduction of temperature is not in direct proportion to the size of the dose, but that, in fact, after large doses sometimes the temperature may rise instead of falling.

In this connection it may be mentioned that at a recent meeting of the New York Pathological Society, Dr. Porter (*New York*

Med. Journ., July 30, 1887) presented the liver and kidneys of a patient to whom large doses of antipyrin had been given, in which, as a result of the action of that drug, it was thought, extensive fatty and granular metamorphosis had taken place. The patient had had only a moderate attack of rheumatism with some elevation of temperature, for the reduction of which pretty full doses of antipyrin were given at rather short intervals. It did not seem to affect the temperature very much. After the patient entered the hospital the temperature went up to 105° F., and following the use of antipyrin it went up to 107° F. The use of antipyrin was then stopped, and salicylic acid was administered. The temperature then fell to 103° F. Antipyrin was given again, and the temperature rose again. Antifebrin also was used, but the temperature went higher and higher, and the patient died with a temperature of 109° or 110° F. The speaker had seen in literature that men who had experimented with antipyretics, such as antipyrin, antifebrin, and thallin, had found extensive changes in the liver and kidneys, and during life casts and albumen in the urine, but they maintained that it was of no practical importance. They also had made the observation that patients treated with these antipyretics recovered less quickly, especially patients with typhoid fever, the duration of the disease being about forty-two days, whereas in those treated with other antipyretic measures, such as baths, it lasted only about thirty-two days. One writer had said that when he used antipyrin he succeeded in getting the highest death-rate, but he was inclined to think the patients were more comfortable while they lived. The speaker had noticed for some time that in the bodies of patients who had been treated with antipyrin there was very frequently granular and fatty metamorphosis of the liver and kidneys. He had, therefore, come to believe that antifebrin, antipyrin, and thallin were not such safe antipyretics as had been maintained.

BETOL—A NEW ANTIRHEUMATIC REMEDY.

THE substitutes for salicylic acid and its salts, which are continually increasing in number, appear to have received an important addition in the introduction of a salicylic ether of napthol, which has been recommended by Sahli, who our readers will remember likewise introduced salol into the therapeutics of rheumatic affections (*Therapeutische Monatshefte*, June, 1887). To this substance Sahli gives the name of betol, and like salol, which divides into salicylic acid and phenol, it splits up in the organism into salicylic acid and naphthol.

Betol appears to possess the advantage over salol in freedom from odor and taste. It contains, however, ten per cent. less salicylic acid than salol, and has likewise the disadvantage of possessing a much higher melting-point (95° instead of 43° C.), a point which is of importance, since the readiness with which such compound ethers split up into their component parts is dependent upon the lowness of their melting-point.

The conditions under which this remedy may be applied do not yet seem to be clearly established, since Sahli states that while he has in numerous cases of articular rheumatism, neuralgia, etc., employed betol with most successful results, in other cases its use has been followed by no improvement. In the latter instances, examination of the urine has shown, by the absence or faintness of the salicylic acid reaction, that the preparation did not become decomposed, as it must do to produce any therapeutic effects. Betol is readily soluble in fluid fats, and Sahli recommends the administration of this substance in solution in oils, with the hope of facilitating its decomposition, since it is known that the melting-point, and therefore the point of decomposition, is lowered by the presence of certain organic bodies.

Kobert, in the preceding number of the same journal, has likewise published a paper on this subject, in which he, almost without qualification, gives the preference to betol over salol, especially in its freedom from disagreeable after-effects. Sahli regards this position as, however, not yet proved. He has given betol in amounts varying from 2 to 12 grammes (15 to 180 grains) in the twenty-four hours, the latter in a six-year-old child. In some instances he has found the most marked effects from the smaller dose, while in other cases the larger amounts have appeared entirely inert. He therefore thinks that in our present imperfect knowledge regarding this substance, betol cannot yet take the precedence over salol on account of its smaller percentage of salicylic acid and its more difficult decomposition; so, also, the substitution of the inactive naphthol for phenol is to be regarded as a disadvantage, since the action of salol is not to be attributed solely to the salicylic acid but also to the phenol, which especially appears to be of value in the treat-

ment of neuralgia. Nevertheless, on account of the freedom from disagreeable odor and taste, betol appears to be well worth further study to establish the conditions in which it is of value and to determine the correct method of its administration.

Kobert, who describes this preparation under the name of naphthalol, found it very useful, and at least as valuable as other medicaments, in various forms of catarrh of the bladder, especially in gonorrhœal cystitis, with alkaline decomposition of the urine. The urine soon became clear and acid, the formed elements in it were diminished in number, and the pains of the patients became easy.

A NEW LOCAL ANÆSTHETIC.

NO physician nowadays can claim to eminence in the medical profession unless he has discovered a local anæsthetic. There is no doubt in our mind that this fact is universally recognized. Witness the innumerable claims to the dignity of a new anæsthetic continually before us. The last candidate for these honors appears to be a joint discovery by a veterinary physician, Mr. Goodman, Dr. A. M. Seward, of Bergen Point, N. J., and Dr. J. Herbert Claiborne, Jr., of New York. Mr. Goodman was first on the scent by noticing the apparent anæsthetic properties of a poultice made from a pile of leaves raked haphazard from the ground. Dr. Seward, according to Mr. Claiborne, discovered an alkaloid in some leaves submitted to him by Mr. Goodman, and he terms the alkaloid, of which the process of extraction is not given, stenocarpine. It appears, however, that the botanical name of the tree from which this substance is derived is unknown. According to Mr. Goodman, the source of the leaves employed by him is known in Louisiana, the locality where this substance was first employed, as the tear-blanket-tree.

It grows to the height of thirty-five to forty feet, with a diameter to the bole of about eighteen inches and a spread of foliage of about thirty to thirty-five feet. The leaves resemble those of an acacia. The bark is smooth. From the ground up the tree is furnished with clumps of forked spines or thorns, the parent spine springing at right angles from the bough or trunk. Though Mr. Goodman is a native of the region, he has never seen the tree blossom. As fruit it bears pods eight or ten inches in length, flat and slightly curved, containing seeds and a viscid juice.

The spines are very tough and highly polished, and the wood is extremely tough. It grows in clumps and singly, and is abundant in Louisiana.

From the likeness of the tree to the *Acacia stenocarpa* Dr. Seward dubbed the new alkaloid stenocarpine. It would have been better, however, to withhold the naming of the alkaloid until the botanical name of the tree had been known.

Dr. Claiborne's share consisted in clinical experiments with the substance supplied him by Dr. Seward. According to Dr. Claiborne (*Medical Record*, July 30, 1887), two drops of an aqueous solution produced in a few minutes complete insensibility of the cornea and conjunctiva, with dilatation of the pupils, the anæsthesia lasting for about half an hour, the dilatation of the pupils for thirty-six hours. This substance would even appear to be more efficacious than cocaine as an anæsthetic, for Dr. Claiborne reports instances in which the application of a few drops of a two per cent. solution on the skin produced almost absolute anæsthesia, so as to permit the painless removal of tumors, warts, etc. In the nose also applications produce complete anæsthesia, and in the case of the ear, the instillation of a few drops permitted the touching of the drum-membrane without pain.

As to whether we are to have another disappointment in this case or not the future alone can tell.

SOLANIN.

AS the readers of the GAZETTE may remember, though discovered in 1821 in potato shoots and in the parings of young potatoes, solanin has been only recently introduced into medicine by Dr. Geneuil, who employed it in subcutaneous injections in sciatica and other forms of neuralgia. Continued experience has, however, proved that so employed solanin injections are extremely irritating, and Geneuil therefore came to the conclusion that solanin possesses caustic action, and he recommended it to be employed only hypodermically in cases where a tolerably severe revulsive was desired.

The subject has again been investigated by M. Adrian, who presented his results to a recent meeting of the Societé de Médecine Pratique (*Les Nouveaux Remèdes*, June, 1887). He has found solanin is not an alkaloid but a glucoside, and if solanin is dissolved in an acid,

the entire amount of acid may be recovered in its free state, while the solanin splits up into glucose, and a new base, still imperfectly known, which he terms solanidine. It follows from this that it is incorrect to speak of solanin salts, and injections made of acid solutions of solanin owe their escharotic properties to the free acid. Nevertheless, it appears that solanin possesses decided analgesic properties.

In the thesis recently published by M. Gainard, he there states as the result of the experiments which he has carried out under Professor Dujardin-Beaumetz, and with Dr. Bardet, that solanin, obtained from the germs of the potato, is possessed of incontestable anæsthetic properties, and is almost free from toxic effects, as much as 15 grains of solanin being required to kill a small rabbit. It is, of course, possible that solanin obtained from different species of Solanaceæ may contain atropine or other allied alkaloid, which will, perhaps, explain the character of the results produced by it. The subject is well worthy further study.

QUILLAJA ACID—A CONTRIBUTION TO OUR KNOWLEDGE OF THE SAPONIN GROUP.

KOBERT, of Dorpat, Russia, contributes an elaborate article under the above title to the *Archiv für Experimentelle Pathologie und Pharmakologie*, 23 Band, 3 u. 4 Heft, of which the following is a concise abstract:

In 1782 Molina described a Chilian tree whose bark gave to water a biting taste, and which he called *Quillaja saponaria*. It is generally counted among the Rosaceæ, although Brown has pointed out marks of difference. The bark of the tree was soon known as "washwood," or "panamarinde." Sections made through the bark show masses of crystals of calcium oxalate and a net work of fibrous tissue. The active principle is contained in formless masses of dark-colored substance, contained in the cells of the parenchyma of the bark. Concentrated sulphuric acid turns this substance first yellow, then bright red, and finally a violet-blue. Early analyses of the plant, after the method of Schroder and others, seemed to demonstrate the identity of saponin with the so-called Egyptian soap-root, the quillajarinde of Henry and Boutron-Charlard, and also the common senega-root, together with other common plants with which we had long been familiar. The importation and use of the Egyptian plant were lessened by the cultivation of the native sources of saponin.

Kobert's analyses of various sources of saponin, from different sources, convinced him that the saponin of various authors is not a simple body, but a combination of at least two substances not easily separated. He found that the separation of saponin by precipitating it with barium was wholly worthless, as the efficiency of the drug was thus more or less impaired. He was led to conclude, however, that the process of obtaining the active principle by its combination with acetyl gave a substance whose poisonous adjuvants were thus destroyed; it was more reliable than the barium process. Pure saponin he found to be a tasteless substance, of unirritating odor, and free from poisonous properties; the symptoms of poisoning following the use of the drug were caused by its mixture with other substances. By a method whose most important steps were concentration of a solution from the boiled bark, precipitation by acetate of lead, the removal of coloring-matter by chloroform, and finally drying the precipitate from a clear solution over sulphuric acid in a vacuum, Kobert obtained a powder, of acid reaction, which he called quillaja acid. With its alkaline salts it is in water, carbonates, and caustics readily soluble. By treating it with alcohol and chloroform crystals may sometimes be obtained, but this happened too infrequently to admit of analysis of the crystals. Only the free acid is soluble in alcohol; this solution will take five times its bulk of chloroform before precipitating the solid. A test between pure saponin and sapotoxin and common commercial saponin lies in the fact that the latter are very little soluble in absolute alcohol. In methyl alcohol quillaja acid is easily soluble; in ether insoluble; in chloroform sparingly soluble by warming. This acid and its alkaline salts hold insoluble powders so well in suspension that their filtration is difficult. It may be best combined in emulsions, as the French have found. Copper sulphate, ferric and mercuric chlorides, ferro- and ferricyanides of potassium, and other allied salts do not precipitate it. Solutions are readily decomposed by bacteria, and germs grow readily in them. Concentrated sulphuric acid colors quillaja acid a beautiful dark red. Further experiments show it to be a glucoside, turning polarized light towards the right; it is found to be a glucoside acid, resembling ergotin acid. Pepsin, pancreatin, ptyalin, and diastase do not decompose it. It was found that quillaja acid and saponin differ in that the latter is an impractical modification of the

former. The formula $C_{19}H_{30}O_{10}$ corresponds to the results of analyses, and it is composed of about one-third of sapogenin and two-thirds glucoside; its acidity is exceeded thirty-five and one-third times by sulphuric acid. Although many have written regarding this substance, yet few have used it therapeutically, and it has as yet no therapeutic literature proper.

A case of poisoning from the drug has been reported by Lessellier. The symptoms were rigors; epigastric cramp; cold sweats; tremors; syncope, which soon disappeared; a small pulse; skin moist; excessive vomiting; anxiety and distress referred to the præcardium; vesical tenesmus, and increased secretion of urine. These symptoms disappeared under expectant treatment in three days. The sodium salts of quillaja acid have a strongly acrid taste. A five per cent. solution applied to the throat promotes salivary flow, and produces great irritation; profuse nasal and lachrymal secretion are caused when the same solution is applied to the nasal passages. In the larynx convulsive cough is produced. A minute particle of the substance, or a drop of two or five per cent. solution, brought in contact with the conjunctiva, produces burning, intense pain, followed by œdema and pus-formation. The pupil is contracted, from irritation; the cornea does not generally become involved, and in five hours after the application the swelling has disappeared. Strong solutions, when painted on the external skin, are inert, but application by ointment with friction produces erythema, with itching and burning, and, if the application be continued, a pustular eruption. The tissues of the frog, when brought in contact with the substance in solution, lose their vitality much more rapidly than commonly. Blood-corpuscles are dissolved or disintegrated by the substance in solution; it is a poison to protoplasm, and injures the vitality of the tissues when brought into direct contact in solutions of even one-half per cent. For injection into the blood a solution of one-tenth per cent. was taken. In fatal cases it was often impossible to find post-mortem changes; death resulted evidently from cerebral paralysis, and paralysis of the respiratory centre. Post-mortem changes were most generally found in the upper and lower portions of the small intestine, and consisted of excessive hyperæmia, profuse secretion, and thickening of the mucosa. Extravasation of blood did not occur, but the capillaries were enormously distended. The toxic effects often went much further than this, and extensive degeneration of the glandular structures of the intestine resulted. A noteworthy phenomenon was the formation of hyaline material about the villi, and the decomposition of the blood. The large intestine showed similar effects in less degree. Endocarditis, especially about the valves, was often present. There was œdema of the hepatic duct and gall-bladder. The urinary bladder and pelvis of the kidney were occasionally the seat of the same changes as the intestine. The urine was full of blood and cystic débris. Hæmoglobinuria and albuminuria were often present. Quillaja acid itself was not found in the urine. Changes in the kidney-structure itself were rarely found, although there was good reason to expect them. The liver was generally slightly enlarged, but not greatly affected. The mesenteric glands were also swollen. The muscles of the general muscular system, and also the heart-muscle, were not affected. As has been stated, the heart-valves were roughened, and at their bases there was swelling and œdema. At the early stages of the poisonous effect no diminution in blood-pressure was observed, but in the later stage of coma a complete vaso-motor paralysis was observed. When the fatal dose was so small that no intestinal lesions were observed, nothing else pathological could be observed, and the fatal result was ascribed to paralysis of the cerebral ganglia by an agent which by repeated circulation in the ganglion-cells successively paralyzed them. In the slowness of its action the drug resembled the heavier metals which are poisonous. The largest fatal dose given was $\frac{1}{12500}$ part of the weight of the animal experimented upon; the smallest dose was $\frac{1}{1030000}$ of the body weight; and when the dose was reduced to $\frac{1}{1166667}$ part of the animal's weight, recovery was the result. After the injection of large doses of the poison into the blood it could not be certainly identified in the urine. It has been shown that quillaja, when compounded with sodium, in solution of $\frac{1}{100000}$, dissolves blood-corpuscles. Hæmoglobinuria was not observed frequently, irregularly only, and it was found that the liver was somewhat distended by decomposed blood-corpuscles after the poison had been injected into the blood. In cases where no changes were observed in the intestines it was found that the number of red corpuscles was diminished, and the intestinal changes were thought to be due more to decomposition of the blood than to any change originating in the intestine. Although this

drug was so poisonous when injected into the blood, when given by the mouth it was much less active. A rabbit took $\frac{1}{500}$ part of its body weight of the drug without any symptoms of poisoning; another took $\frac{1}{1800}$ part of its body weight with no worse result than diarrhœa for two days. The intestinal symptoms following death from the drug, when given by the mouth, were wanting, a notable difference from its effect when injected into the blood. Kobert reckons that five hundred times as great a dose can be taken by the mouth without injury as can be given by injection into the blood; this depends upon the very slow rate of absorption of the poison by the intestine. It is not decomposed by the ferments of the pancreas, stomach, and saliva, for it was found in the fæces. The subcutaneous injection of the drug was practised upon frogs, on whom between ½ and ⅓ of a grain produced fatal effects. A notable effect of poisonous doses subcutaneously was ideomuscular contractions, which persisted in the skeletal muscles for twenty-four hours after life had apparently ceased; rigor mortis subsequently ensued. In warm-blooded animals injections subcutaneously caused great pain, with local hemorrhagic inflammations, with a tendency to abscess-formation and œdema. The injected fluid could be found after several days in the fluid of œdematous tissues. Fatal effects followed such injections very tardily, showing the slow absorption of the poison. Intestinal changes were not often observed. Several hemorrhages were seen beneath the pleura in one case. The dose was in one case of poisoning by subcutaneous use $\frac{1}{250000}$ of the body weight. In cases where the poisonous symptoms were slow in development, minute hemorrhages were found in the subserosa of the intestines.

In distinction from quillaja acid saponin was found almost non-toxic, having but feebly the effects of the acid, although decomposing to some extent blood-corpuscles. It was thought to be at least thirty per cent. weaker than quillaja acid.

Reports on Therapeutic Progress.

INTUBATION OF THE LARYNX.

Intubation of the larynx was recently made the subject of debate before the New York Academy of Medicine, and we lay before our readers a full abstract of the papers read, as published in the *Boston Medical and Surgical Journal* for July 28, 1887.

Dr. F. Huber read a paper based on a study of forty-seven cases, the results of which had convinced him, he said, that at the present time tracheotomy should only be resorted to in cases in which intubation had failed to afford the needed relief; and he was of the opinion that a case of this kind would seldom be met with. Having stated that the dyspnœa was as effectively relieved by intubation as by tracheotomy, he spoke of the advantages of the former, and also referred to the origin of the procedure as proposed and practised by Bouchut in 1858. Then, after referring to some practical points derived from his personal experience, he said that intubation had now passed through the experimental stage, and that its utility had been fully established by numerous operators in different parts of the country. Notwithstanding the gratifying results obtained, however, it had as yet received very little favor, or even attention, in Europe.

Of his forty-seven cases, Dr. Huber said that twenty-nine, with eleven recoveries, were in children under three years of age, and eighteen cases, with nine recoveries, in children of three years or-over. Of the children under three years, one was nine and one-half months; one, ten and one-half months; two, eleven months; one, one year; two, two years; two, two and one-half years; and two, two years and eight months old. Of all the children that he had been called upon to treat, who were suffering from laryngeal stenosis, he had found it necessary to resort to intubation in only one out of every three or four cases, and he thought that it should not be practised until dangerous symptoms had supervened. He used it, in fact, in exactly the same class of cases in which one year ago he would have performed tracheotomy. Having spoken of the diagnosis of croup and the indications for surgical interference, he referred to the importance of making a careful examination of the neck and chest, and said that he had known cases of retro-pharyngeal abscess and empyema to be mistaken for laryngeal stenosis. As confirmatory of the diagnosis of the latter, relative absence of fever, in uncomplicated cases, was of much value; and aphonia, with difficulty of both inspiration and expiration, was positively indicative of croup.

He next spoke of the various accidents and mishaps which had been met with in connection with intubation, and the objections raised against the procedure. He referred first to the gag, and said that O'Dwyer's gag was

liable to be displaced by the struggles of the patient, but that this was not the case with the one devised by Dr. Denhart, which he exhibited. The thread attached to the tube should be eighteen or twenty inches in length, and, if not withdrawn at once, should be passed over the ear and secured. In order to avoid accidents in introducing the tube the efforts to place it in position should be short and repeated, rather than kept up uninterruptedly for any length of time. One of the most serious accidents that could occur was the pushing of dislodged membranes before the tube, and in a case of this kind Dr. E. D. Fergusen, of Troy, was obliged to resort to tracheotomy.

Several deaths had been reported from this accident, and Dr. Waxham had recently devised a long tracheal forceps for the purpose of removing the membranes when it occurred. In a case of his own in which it happened he gave the child brandy, with the effect of exciting a fit of coughing which expelled both the tube and the membranes. If, at any time after the tube had been introduced, noisy breathing should set in, it was an indication for the temporary removal of the tube. The tube had been known to be coughed up and then swallowed. Instances had also been reported in which the tube had slipped through the larynx into the trachea ; but this was when the earlier pattern of tube, with small head, was employed. The tube did not act as a foreign body when in the larynx, giving rise to choking sensations and coughing ; but if it remained in position for a considerable length of time it might possibly produce slight ulceration. This, however, did no harm.

As to the time for removing the tube, in some cases this might be done as early as the fourth or fifth day, although it was often desirable to allow it to remain longer. As a rule, however, it could be dispensed with at a much earlier date than the tracheotomy tube. If the respiration continued free, the tube should generally be allowed to remain until the fifth or sixth day; but if the respiration became noisy it should be promptly removed, and afterwards reintroduced, if this should prove necessary. When there were diphtheritic patches discernible in the nose or pharynx it was advisable, as a rule, to leave the tube in position until they had disappeared.

In intubation, as in tracheotomy, the prognosis was more favorable when there was simply local obstruction in the larynx than in cases where there was marked constitutional infection from the diphtheritic poison. No age offered a contraindication to intubation. No positive prognosis should ever be made, however, until forty-eight hours had elapsed from the time of insertion of the tube.

As regards medicinal treatment, Dr. Huber said that it was his practice to keep up the use of bichloride of mercury throughout the course of the disease, whether intubation were resorted to or not. He employed it, in accordance with the views of Dr. Jacobi, in larger doses than those usually recommended, giving from $\frac{1}{6}$ to $\frac{1}{2}$ a grain, and in severe cases as much as 1 grain, in divided doses, during the twenty-four hours. When there was much difficulty in swallowing, he gave it in the form of tablet triturates, of $\frac{1}{40}$ of a grain each, mixed with sugar and placed dry upon the tongue. If there were extensive diphtheritic membranes in the fauces he also employed tincture of iron and chlorate of potassium. In threatened heart-failure he resorted to brandy, caffeine, etc. If the temperature was very high, antipyretics were employed either by the mouth or rectum. Finally, he used the steam atomizer for producing a moist vapor.

Intubation, he went on to say, possessed every advantage possessed by tracheotomy. It could also save many cases in which tracheotomy would not be permitted, as well as many which would die if the latter were performed, especially in children under three years of age. Out of twelve cases in which Dr. Huber had resorted to tracheotomy, ten had proved fatal. He had also seen many cases in the hands of others in which the results were no more favorable, so that he felt warranted in assigning to intubation a much higher position.

Dr. J. O'Dwyer read a paper on "Feeding after Intubation of the Larynx," in connection with which he exhibited various tubes modified to overcome difficulty in feeding. He also showed specimens with the tube in position, and a section of the cricoid cartilage filled up with membranes, except where the tube had left an opening, the form of which was just the shape of the latter.

The difficulty of swallowing, he said, was recognized by all as the most important objection to intubation, and he had long been trying various modifications in the shape of the tube in order to diminish this as far as possible. At first he tried making the heads of the tubes quite small ; but, while this rendered it possible for them to slip down into the trachea, it did not make deglutition any easier. The next modification that he made was to increase the size of the head to some extent, and also give the tube a greater curve, in

order to avoid ulceration at the base of the epiglottis. The third modification was to make the posterior surface of the tube longer than the anterior surface, so as to allow the epiglottis to pass over it more completely. Next, he increased the size of the head still further, so that it should fill the cavity of the larynx, and prevent fluid and other foreign substances from entering around it. The fifth modification was to make the upper surface of the tube concave, so that it would adapt itself more perfectly to the conformation of the parts, and this modification had the effect of rendering it very easy to remove the tube. With the pattern commonly used, extraction had always proved the most difficult part of the procedure.

The last modification which he had adopted was to give to the upper portion of the tube a double backward curve, in the hope of increasing the facility of swallowing, and this, at all events, had the effect of preventing ulceration of the anterior wall of the trachea, which hitherto had sometimes been quite extensive. Any one, however, who practised intubation at all largely would find it advisable to employ a variety of tubes according to the circumstances of particular cases; and he had lately devised a large, short tube for temporary use in certain instances. The string could be left attached to it, and he thought it probable, on account of the large calibre of the tube, that membranes might sometimes be coughed up through it.

Notwithstanding all his modifications, Dr. O'Dwyer said that he still found about the same difficulty in swallowing present. Solids and semi-solids, as a rule, were taken much better than liquids. Food would not enter the tube if the epiglottis was normal. In a number of instances he had removed the tube in order to give nourishment; but the results were no better than when it was in position. In some cases, particularly when nephritis was present, there was nausea and vomiting, as well as anorexia. Sometimes, however, swallowing was more readily accomplished than before the insertion of the tube, on account of the relief which it afforded to the urgent dyspnœa. As a rule, the longer the tube remained in position, the easier it became to swallow. When the patient was old enough to understand, he always gave instructions that drinking should be done rapidly, and that as large a quantity of fluid as possible should be taken at one time. Then, by coughing, the tube could be freed from any of it that might perchance have entered. Sometimes he employed rectal alimentation, but he very seldom had to resort to the stomach-tube.

Passing on to speak of pneumonia, Dr. O'Dwyer said that in his opinion this might arise from (1) the presence of secretions in the lower air-passages; (2) an excess of blood drawn out of the lungs; (3) atelectasis (in the same cases in which there was an extension of the membranes); (4) the presence of a tube either in the larynx or the trachea. He did not believe that food was a cause of pneumonia, as there was no evidence that food had ever been found in the minute bronchi. He had known a patient (an adult female) to wear a tube in the larynx for over ten months, who not only did not have pneumonia, but who in the mean while recovered from bronchitis, which she had at the time the tube was put in.

He had lately had constructed two hard rubber tubes designed for all kinds of acute laryngeal stenosis in adults; the smaller one for women and young males, and the larger for full-sized males. The principal difference between these and the metallic tubes was in regard to their weight and the size of the calibre. While a rubber tube weighed only one hundred grains, an adult metallic tube weighed an ounce and three-quarters, and the rubber tube was fully double the calibre of the metallic. As regards the comparative comfort of the two kinds of tubes, one patient found the metallic tube the most satisfactory, while another, who was a syphilitic and had a very sensitive larynx, preferred the rubber. In the latter case the metallic tube produced ulceration, which was not the case with the rubber one, while greater freedom of movement and facility of expectoration were also secured with the latter.

Dr. Dillon Brown read a paper on "Statistical Records of Intubation." As far as he had been able to ascertain, there had been reported altogether seven hundred and sixty cases of intubation, by fifty-four different operators; and of these he had tabulated five hundred and two cases. Two hundred and eleven, or 27.07 per cent., had recovered. The average age of the children who died was three years and two months, and of those who recovered, four years and one month. In those who recovered, intubation was resorted to at an average period of two days and nine hours after symptoms of laryngeal stenosis had first appeared, and in those who died, at an average period of one day and nineteen hours. In the fatal cases the average time

between intubation and death was two days and eight hours; and in those which recovered the average time during which the tube was worn was five days and three and one-half hours. The causes of death he found were given in three hundred and thirty-nine of the fatal cases. Those who had performed intubation in the largest number of cases were O'Dwyer, seventy-eight cases; Waxham, one hundred and six cases; Dillon Brown, eighty-four cases; and Huber, forty-seven cases.

Unavoidable accidents, Dr. Brown went on to say, were rare, and, with the exception of the one of pushing the membranes before the tube, were not important. From the use of too much force false passages had been made in two instances. The slipping of the tube down into the trachea, which had been reported in several cases, could never occur if a tube of proper size was employed. In two cases the tube had passed into the œsophagus, instead of the larynx; but there was no reason why this mistake should be made if sufficient care were taken. In order to avoid as far as possible the danger of pushing membranes before the tube, he advised that the latter should be pressed well down, and held firmly in position with the finger until the obturator had been removed. Coughing up of the tube was a source of danger, but this could, as a rule, be avoided if a tube with a sufficient retaining swell was used. If there were paralysis of the muscles, however, this accident was liable to occur, notwithstanding an ample retaining swell. As to the causes of death after intubation, the extension of the membranes to the bronchi was the most frequent, and he believed that pneumonia, when present, was secondary in character.

Dr. W. P. Northrup read a paper on the "Pathological Anatomy of the Respiratory Tract after Death from Laryngeal Diphtheria and Intubation." In a paper on this subject, which he read before the Academy in December last, Dr. Northrup said that he had reported eighty-seven fatal cases. Since that time twenty additional fatal cases had occurred at the Foundling Asylum, so that he had now altogether one hundred and seven cases on record. The cause for this large number during so short a period as four months was the occurrence of diphtheria in connection with a fatal epidemic of measles and scarlet fever. The severity of the outbreak was shown by the fact that all the fatal cases had pneumonia, and thirteen of them nephritis. In his former paper he had stated that he had never met with ulcers of the trachea; but in the twenty cases now reported for the first time there were deep ulcers, laying bare the rings of the trachea, in no less than five instances, and he presented the specimens from these cases. He had not as yet met with ulceration of any consequence caused by the head of the tube,—nothing more, in fact, than necrosis of the epithelium. He had never seen any evidence of aspiration pneumonia, as it was called, due to the entrance of milk or other fluid into the finer bronchi.

Dr. Irvin H. Hance read the report of a "Case of Laryngotomy after Intubation." It was met with at the Nursery and Child's Hospital, and the patient, who was twenty months old, and suffering from scarlet fever and diphtheria, twice coughed up the tube. After it had been introduced a third time the tube became obstructed, and had to be removed. At this time the child was so exhausted that artificial respiration had to be resorted to for a while. The tube was then inserted for the fourth time, and again it filled up with mucus, and had to be withdrawn. After being introduced a fifth time it again became occluded, and was finally coughed up. The stenosis still continuing, laryngotomy was performed, at the crico-thyroid membrane, and complete relief from the dyspnœa was at once afforded. The child died the next day, however, of the scarlatinous disease.

In this case, he said, the tubes were thoroughly tried, and were found to be utterly valueless. Their failure, he thought, was probably due either to the large quantity of tenacious mucus present or to the dislodgement of diphtheritic membrane. It was a question whether tracheotomy should not have been resorted to earlier, before the child had become so exhausted by the existing condition and the repeated introduction of the tube.

In conclusion, Dr. Hance alluded to other cases in which laryngotomy or tracheotomy had to be performed after a trial of intubation. Nine such cases, including his own, had been reported, and among these there had been three deaths and five recoveries, while in one instance the child was still under treatment at the time the report was made. The operation had been performed or advised under the following circumstances: 1. Great irritability of the larynx. 2. When membranes are pushed down before the tube. 3. When the tube became plugged up with dislodged membrane. 4. When there was a return of the dyspnœa with absence of the

tube from the larynx. 5. When the tube became wedged in the larynx.

As to laryngeal spasm, he had found that this could usually be controlled with belladonna, nitre, and chloral. Practically, the only condition calling for tracheotomy was the obstruction of the tube by membranes, and this was a very rare occurrence. The attempt had been made to remove the membranes with forceps. Finally, he said that he would advise resorting to tracheotomy only after intubation had failed.

In reply to a question of the President, Dr. A. Jacobi, DR. O'DWYER stated that in his later cases he had performed tracheotomy after intubation in only one instance. His own experience had been so unfavorable in this operation that he was not disposed to hope for much from it. As to removing membranes with the forceps, the subglottic division of the tube was of such narrow calibre that it was practically impossible to use this instrument, and he had, therefore, devised a flexible apparatus for this purpose somewhat on the principle of the umbrella probang. He knew of no wedging in the larynx that could occur except such as was sometimes met with when a tube with a very small head was used. Like Dr. Northrup, he had never seen any evidence of the so-called aspiration pneumonia arising from the entrance of food into the bronchi. The secretions, he believed, were the source of the pneumonia that was found after intubation, there being aspiration of these into the finer bronchial tubes. It was due primarily, however, to the presence of the tube, because the latter impaired the patient's power of expulsion, the secretions under these circumstances not being gotten rid of with the same facility as through the normal larynx.

The PRESIDENT said that he was much pleased to hear both Drs. O'Dwyer and Northrup say that they had never seen any reason to believe that pneumonia originated from the presence of food. He would like to inquire of Dr. Northrup whether lobar pneumonia was of frequent occurrence, and if so, whether this was found especially in cases of sepsis.

DR. NORTHRUP replied that in the eighty-seven cases previously reported by him, twenty-seven were believed to have died from extension of the diphtheritic membrane. In a large proportion of these there were found membranes extending from the tip of the nose to the finest bronchi of the lungs. Bronchial diphtheria, with œdema, was a marked feature at the autopsies. Pneumonia, when it did occur, was of late origination. It affected both lungs, and was lobular, not lobar, in character. In not more than one-fourth of the cases could it be said to have been the cause of death.

DR. CAILLE said that it was too early as yet to speak a final word as to the merits of intubation. Many of the cases published had been reported in such a way as to render them of no practical value. In comparing this procedure with tracheotomy in his own experience, he found that he had performed tracheotomy in twenty-one cases, with five recoveries, and intubation in sixteen cases, with six recoveries. In his cases of intubation, diphtheritic membranes were observed on the nares or pharynx in nine instances. Most of the cases were seen in consultation, and, as a rule, intubation was undertaken rather late. He believed that all the patients would have died without surgical interference, and that one who died would have recovered if intubation could have been practised earlier. The cause of death after intubation he had found to be catarrhal pneumonia in a majority of his fatal cases. It was a fact that most of the children who died had taken liquids, and of late he had allowed only solids, cut up fine with rice to allay thirst. Since he had adopted this course his results had been better.

In conclusion, he said that intubation was to be preferred to tracheotomy in the majority of instances. When the pharynx and nares are affected, intubation is preferable, as a rule, to tracheotomy, especially when the after-treatment of the latter cannot be carried out satisfactorily. Tracheotomy is preferable to intubation in some cases, hopeless without operation, provided the surgeon can operate and carry out the after-treatment under the most favorable conditions. These statements apply to intubation with the present style of tubes.

The subject may be concluded by the following summary of the present status of intubation published by DR. E. FLETCHER INGALS in a recent number of the *New York Medical Journal:*

1. Intubation may be quickly and easily performed, and with but little danger.

2. Friends readily consent to the procedure.

3. There is no necessity of tedious after-treatment, as the tube is kept clear by the respiratory efforts.

4. The results so far are practically as good as those of tracheotomy at all ages, and apparently better in very young children.

5. To secure the best results, great care must be taken to prevent the entrance of foreign substances into the trachea.

6. At present, with O'Dwyer's tubes, the most successful plan is to absolutely prohibit the deglutition of fluids while the tube remains in the larynx. Small bits of ice may be sucked to allay thirst; soft solids may be swallowed, and fluids may, if necessary, be supplied by enemata, or the tube may be removed to feed the patient, and then be reintroduced.

7. Tubes with smaller heads, designed to rest on the vocal cords, have not yet been used sufficiently often to enable us to speak positively about them. If experience proves that they do not often slip into the trachea, and that they do not injure the vocal cords, they will be especially useful, for they will nearly overcome the difficulty in deglutition, and patients wearing them may eat and drink at pleasure, excepting when paralysis or some other result of the disease prevents closure of the epiglottis.

8. Medical treatment should be carefully attended to after intubation, and we must spare no effort to prevent extension of the disease to the bronchial tubes, or to relieve the dyspnœa which it occasions. Dr. Ingals apprehends that successful after-treatment depends largely upon the judicious and timely use of suitable expectorants and respiratory and cardiac stimulants.

9. Though short tubes may be used with good results in some cases, the danger of their becoming filled with pseudo-membrane is so great as to render long tubes preferable.

10. Intubation may and should be practised early, and it does not preclude subsequent tracheotomy.

11. For serious cases of spasmodic croup, and for œdema of the glottis, this will prove a most useful procedure.

12. For the treatment of chronic laryngeal stenosis this method will, doubtless, be of value.

NEURALGIA OF THE FIFTH NERVE.

At a recent meeting of the Odontological Society of Great Britain, PROF. VICTOR HORSLEY, F.R.S., read a paper on the "Pathology of Inveterate Neuralgia of the Fifth Nerve" (*British Medical Journal*, July 23, 1887). He first gave a short history of three cases of this distressing malady which he had treated with apparent success by avulsion of the nerve. Two of the patients were shown at the meeting. All of them had come under his observation at a very late stage of the affection, the shortest period being three years and a half after the onset of the mischief, and in one case as much as seven years after. All were practically edentulous when they came to him, and from all of them after the operation he had heard the same story, namely, gratification at being relieved from pain, and regret at the loss of so many sound and useful teeth. Were there, then, no indications by which it was possible to diagnosticate pain which was due to mischief somewhere along the trunk of the nerve from that which was due to disease of the teeth? If that could be done with any degree of certainty, it would mark a very important advance in dealing with these painful and often troublesome cases, and it was with the hope of obtaining some help from the members of the Odontological Society in deciding this question that he had brought the subject before the society. Pain referred to one of the branches of the fifth nerve might be due to mischief of cerebral origin, to irritation somewhere along the trunk of the nerve, or at its peripheral extremity. It was scarcely necessary to dwell on the possibility of the pain being due to intra-cranial mischief, since the general rules applicable to this class of cases would generally suffice for the discovery of the seat of the trouble. The diagnosis between some affections of the trunk of the nerve and of its peripheral termination was not so easy; but, judging from his own experience, he thought there were points which might assist in forming a decision. Trophic changes, when present, were a very valuable indication of mischief in the trunk of the nerve. Thus, in one of his cases, the lower lip was greatly swollen, the skin being glazed and excessively sensitive, or the vessels might be at one time dilated, and at another just the opposite. Wasting of the muscles was another evidence of the same kind. Certain abnormal conditions of sensation were also valuable. In an ordinary case of toothache all the branches of the fifth nerve might seem to be affected; but in cases where the disease was in the trunk of the nerve, the skin might be hyperæsthetic at one place and anæsthetic at another. Another characteristic form of hyperæsthesia was that in which gently touching the skin caused extreme pain, whilst firm pressure caused no pain at all. As to the apparent origin of the pain, he found that in most cases the patient said it began in the teeth, but in some cases it was said to begin in the bone or in the skin. If the pain was

primarily referred to the teeth, it might be due to them or it might not; but if it began in the bone or skin, and only affected the teeth subsequently, he thought it might be inferred that the disease was in the trunk of the nerve. If, in addition to severe pain over the area of distribution of the nerve, distinctly tender spots were met with along the course of its branches, this was generally an indication that the whole nerve was in a state of irritation, but a somewhat similar condition might sometimes be met with as the result of peripheral irritation. If the pain was brought on most commonly by movement, this seemed to indicate affection of the nerve-trunk. All his patients stated that opening the jaw to eat or to talk brought on pain, and, so far as he was aware, the effect of movement in causing pain was not so marked in cases where this was due to peripheral irritation. With regard to the treatment of these cases, of course any sources of dental irritation should be removed, and in some this would effect a cure. He had found that drugs invariably failed sooner or later. He thought that experience had made it clear that nerve-stretching, though a satisfactory operation as regards some nerves, should not be performed on the fifth; although it gave relief for a time, the pain invariably recurred. Avulsion, on the other hand, performed as close to the aperture of exit from the skull as possible, generally cured, the success of the operation seeming to depend greatly on success in obtaining primary union; nor was the removal of the nerve followed by any trophic changes in the parts supplied by it. A discussion followed.

THE MECHANISM OF THE THIRD STAGE OF LABOR.

At a recent meeting of the Obstetrical Society of London, Dr. Francis H. Champneys dealt with Part 4 of this subject under the heading "Some Causes of Retention of the Membranes" (*The Lancet*, July 16, 1887). Having referred to the description of the process given in a former paper, the author showed that the "plane of least resistance" for separation of the membranes is in the decidua, generally in the ampullary layer. Any change which renders this more tough, or which renders any other layer more friable, will alter this "plane of least resistance." Thus, undue friability of the chorion, or less firm adhesion between chorion and amnion than between the layers of the decidua, will determine a separation of the chorion and amnion. The early separation of the lower pole of the ovum tends to guard against a common defect,—viz., failure of separation (retention) of the membranes round the os internum. Rupture of the membranes at the proper time is an essential part of the proper mechanism. The proper time is, in nature, when the os is about three to three and a half inches in diameter, and has a projection of three-quarters to one inch. Premature rupture will prejudice the separation of the lower pole of the ovum. Too late rupture tends to produce prolapse of the bag, which is usually accompanied by giving way of the chorion and advance of the amnion alone. Undue or relatively undue toughness and elasticity of the amnion are equivalent to a tardy escape of the waters. As regards the removal of the membranes by traction of the descending placenta, the author remarked that the membranes as a whole owe their tenacity principally to the amnion; the adhesion of the amnion to the chorion is no doubt one of the safeguards against retention of the chorion. Thus any disorder of the first process of the mechanism tending to separate the two ovuline membranes predisposes to retention of the chorion. An analysis of ninety cases bearing on the matter was given. The conclusions were: 1. That the mechanism of the detachment and expulsion of the membranes is a complex act in three stages. 2. Timely rupture of the bag of membranes is an essential part of the proper mechanism, and too early or too late rupture alike predispose to retention of the chorion. 3. Disorder of any of the three stages in the mechanism tends to prejudice the whole process. 4. Among allied conditions may be mentioned too early or too late rupture of the membranes, prolapse of the bag of membranes, prolapse of the membranes (amnion) after delivery beyond the vulva; separation of the membranes found on examination of the placenta; retention of a ring of membranes round the lower pole of the uterus; retention of the whole chorion. The practical conclusions were: 1. The membranes should generally be preserved till the os is fully dilated. 2. After this they are not only (in ordinary cases) useless, but they—that is, the persistence of the amnion—favor the retention of the membranes. 3. They should, therefore, be ruptured when the os is fully dilated. 4. In vertex cases, if the head has settled over the os uteri, the advance of a smooth, sausage-shaped protrusion of membrane points to advance of the amnion alone, which favors retention of the chorion.

5. Separation of two membranes not only points to adhesion of the chorion, but renders its subsequent removal more difficult. 6. This axiom may be formulated: "When the membranes advance low in a vertex case, look out for retention of the chorion."

LITHIUM CARBONATE AND SODIUM ARSENIATE IN CARBONIC ACID WATER IN THE TREATMENT OF DIABETES MELLITUS.

At a recent meeting of the Therapeutical Society of Paris, Dr. Martineau made a brief communication, in which he stated that for several years he had treated cases of diabetes mellitus with a solution of lithium carbonate and sodium arseniate in ordinary carbonic acid water, to the exclusion of every other medicinal remedy, and with a moderately strict antidiabetic diet. Dr. Martineau claimed that he had cured sixty-seven out of seventy cases of arthritic diabetes by this method of treatment, which he had borrowed from a practitioner now dead, the late Prof. Rouget, of Paris. The communication was discussed by Dr. Dujardin-Beaumetz and others, who regarded the method as so simple and, to say the least, innocuous that it was worthy of trial.

The preparation recommended by Dr. Martineau was the following. Into an apparatus such as is commonly used in Paris for extemporaneously making carbonic acid water, are put twenty centigrammes of lithium carbonate and a tablespoonful of a solution of twenty centigrammes of sodium arseniate in five hundred grammes of distilled water. The quantity of carbonic acid water used is about one litre. This quantity is to be drunk by the patient during each day, either by itself or mixed with ordinary wine at meals.

The simplicity of this remedy led Dr. Austin Flint to test its efficacy in certain cases of obstinate diabetes which he had under treatment, and he published his results in the *Medical News* for July 9, 1887. The ten cases reported led Dr. Flint to the following conclusions:

1. In the three severe cases in which the solution of lithium carbonate and sodium arseniate in carbonic acid water were used, no very marked effects were observed in the few weeks during which the remedy was employed; but the treatment seems to be worthy of more extended trial, and it may be useful in mitigating the severity of a strict antidiabetic diet.

2. The so-called specifics for diabetes have little if any effect. An exception, however, may be made in favor of the arsenite of bromine, which has sometimes seemed to control, to a slight extent, the thirst, polyuria, and discharge of sugar.

3. The main reliance in treatment is to be placed upon an antidiabetic diet. This has fallen somewhat into disrepute because it is seldom efficiently carried out. In no single instance, out of ninety-nine recorded cases, did Dr. Flint find that the antidiabetic diet had been enforced.

4. Milk should be absolutely interdicted. Its influence over the progress of the disease is prompt, powerful, and most injurious.

5. There are certain cases in which dietetic treatment promptly arrests the disease and keeps it under control. There are other cases in which treatment seems to be of little avail, except in possibly retarding the progress towards a fatal result. Of the ten cases reported, and now under observation, seven are amenable to treatment and three are obstinate.

6. A confirmed diabetic may be cured, in the sense that all symptoms will disappear; but the disease is liable to return at any time under an unrestricted diet. Still, moderate care in diet will often secure immunity.

7. A patient who has once had diabetes should have his urine examined every few weeks. The glycosuria always precedes the general symptoms of the disease, and these general symptoms can generally be forestalled by proper treatment employed as soon as sugar makes its appearance in the urine.

8. As the disease returns, either from imprudences in diet or from other causes, the successive recurrences present greater and greater difficulties in the way of treatment.

CANNABIS INDICA IN DIARRHŒA.

In a preceding issue we referred to the recommendation by Dr. Rennie in the *Indian Medical Gazette* of the employment of cannabis indica in the treatment of dysentery. In the *Practitioner* for July, 1887, Dr. Frederick F. Bond and Mr. B. E. Edwards call attention to the value of this treatment in summer diarrhœa. Attention was first turned to this use of cannabis indica by Dr. Turner in 1866, who employed the following prescription:

℞ Tincturæ cannabis indicæ, ♏x;
Spiritus chloroformi, ♏x;
Tincturæ kino, ʒi;
Aquæ menthæ piperitæ, ad ℥i.

The authors state that they have been in the habit of prescribing the above formula combined with small doses of morphine with marked benefit in nearly all forms of diarrhœa, the effects being most striking in the summer diarrhœa, in which affection the great depression, the frequent watery stools, the vomiting and cramp-like pains are quickly relieved, the appetite speedily returns, and cure is usually effected by the second or third day. They recommend the following combination :

℞ Tr. cannabis indicæ, ♏x;
Liq. morph., ♏v vel ♏x;
Spts. ammon. aromat., ♏xx;
Spts. chloroformi, ♏xx;
Aquæ, ad ʃ℥i.

To be repeated every one, two, or three hours according to circumstances. Directions.—*No food for several hours, but a little brandy and water.*

It appears to act by increasing the astringent and anodyne properties of the morphine (the dose of morphine would have very little effect alone), by its stimulant effect on the nervous system, improving the tone, and by improving the appetite, enabling the system to quickly overcome the marked depression and exhaustion. Most remedies in this disease rather retard the return of the digestive functions, but from our experience Indian hemp markedly accelerates it. Indian hemp seems also to frequently counteract the bilious action of morphine, as well as the loss of appetite, and allows it to be given where it otherwise would not be tolerated.

In other forms of gastro-intestinal disturbance it is also valuable, probably for the same reasons. It was of marked use in a case of subacute gastro-enteritis, which had existed for a few weeks before it came under the author's care, in a girl aged 13 years, showing the following symptoms: marked anæmia, which had gradually come on after the other symptoms; constant pain over the abdomen, especially in the epigastric region, increased on pressure and after food; tongue covered with yellowish-white fur; loss of appetite; vomiting at variable times after food of partly digested material; diarrhœa, six or eight stools in the day, which were watery and green, containing partly digested food-material; some rise in temperature,—a little over 100° F. She was first treated with bismuth, then with effervescing mixtures, with no benefit; then with the cannabis mixture (modified to suit her age), and the symptoms very quickly subsided, the vomiting and diarrhœa were checked, the pain ceased, and the appetite returned. By the end of the week all the symptoms had disappeared except the anæmia, which persisted for a short time longer.

THE CREASOTE TREATMENT OF PULMONARY TUBERCULOSIS.

SOMMERBRODT, of Breslau, is quoted by the *Medicinische Chirurgische Rundschau* for June, 1887, as reporting five thousand cases of pulmonary tuberculosis treated by creasote. His studies have extended over nine years in time, and the patients so treated were all ambulatory cases. By the use of Bouchard and Gimbert's formulæ he treated a number of patients, twenty-seven per cent. of whom recovered. The formulæ most used were 13.5 parts creasote to 1 quart alcohol or Malaga wine; also 2 parts of creasote to 150 of ol. morrhuæ. Of both of these preparations from 3 to 6 minims of creasote were taken daily. He also used the following :

Creasote, 3.5 parts;
Alcohol,
Aquæ, āā 125 parts.

Of which a teaspoonful was taken twice daily in a glass of water by thirty patients. Following the method of Reuss, the best results were given by the following : Gelatin-capsules, containing each ¾ minim of creasote and 3 minims of balsam of tolu. The first day of treatment the patient took one of these capsules, on the second day two, and then for eight days three were taken, after meals, with water. In the second week four capsules daily were taken, in the third five capsules daily, and in the fourth week six capsules daily, always after the principal meals of the day. The remedy, when so given, was generally well borne; they were rarely taken except at meals; their use was continued frequently for a year, and was combined with treatment in favorable climates. The best results were obtained in young patients, in the first stages of the disease, with ill-defined symptoms. In scrofulous gland-affections the results obtained were also good. The irritation and frequent cough present were generally relieved, so that narcotics could be discontinued; bronchial secretion and night-sweats lessened. Sommerbrodt believes that many

such cases can be greatly improved. The remedy must be used for three months or a year, and the more that can be taken the better the results.

MELON-ROOT AS AN EMETIC.

Heberger in describing (*Repertoire de Pharmacie*) the bitter principle of the Cucurbitaceæ attributed emetic and purgative properties to melon-root. Torosicvicz (*Bolletino Farmaceutico*) has found that the emetic principle is a bitter substance extractable by alcohol from the aqueous extract of melon-root, which he designates melon emeitine. It occurs in compact brownish masses, breaking with a shining fracture. It is very deliquescent. The aqueous solution has a piquant, bitter taste. It does not react with alkalies or acids, and colors ether. It quickly dissolves in alcohol, but is readily precipitated therefrom by lead acetate or infusion of galls. Liquor ammonia and liquor potassæ dissolve it readily, and from the resulting solution a brownish-gray precipitate is thrown down on addition of acid, which is rather insoluble in water. Recent experiments show that 9 centigrammes of melon emeitine produce vomiting. Dr. Langewicz states that the wild plants contain more melon emeitine than the cultivated.—*Western Druggist*, July, 1887.

TREATMENT OF PHTHISIS WITH INHALATIONS OF HYDROFLUORIC ACID.

Seider, of Paris, has applied this treatment by impregnating the air of the room of phthisical patients with spray, driven by a rubber balloon, and obtained from a solution of 3 parts water to 1 part hydrofluoric acid. The inhalations were made daily for twenty to thirty days in succession. They were at once followed by a relief of the oppression and dyspnœa; the cough was a little more frequent, the night-sweats lessened, and sleep returned. The expectoration was lessened, appetite and body weight increased; an improvement was plainly discernible.—*Medicinische Chirurgische Rundschau*, June, 1887.

GYMNEMIC ACID.

Gymnemic acid is an organic acid, discovered by Hooper and described before the Nilgire Natural History Society (*Nature*), present to the extent of about six per cent. in the leaves of *Gymnema sylvestre*, a plant indigenous to East Africa and in the East Indies adjacent to Bombay. It resembles crysophanic acid, but has the peculiar property of destroying the sweet taste of sugar and saccharine liquids, as also the bitter taste of substances like quinine. It is extracted from the leaves by water and precipitated by sulphuric acid, being in combination with a base not yet investigated. Its employment for pharmaceutical purposes, however, must remain speculative until its therapeutic properties are further investigated.—*Western Druggist*, July, 1887.

The powdered root has for a long time been used among the Hindus for snake-bites. It is applied locally and taken in the form of a decoction internally. The most curious property of this plant is its effect upon the sense of taste. When the leaves are chewed, all power to appreciate the taste of sugar ceases. Powdered sugar tastes like so much sand. When an insufficient quantity of the leaves are chewed the sugar has a saltish taste. In gingerbread the taste of the sugar disappears and that of the ginger alone is detected. A sweet orange tastes like a lime. Sulphate of quinine tastes like so much chalk. The effect seems to last for several hours. The active principle of the leaves Mr. Hooper calls gymnemic acid. It does not affect the power of tasting sour, saline, or astringent substances.—*Albany Medical Annals.*

THE EFFECT OF HYOSCINE HYDROCHLORATE.

Kobert, of Dorpat, Russia, is quoted as follows by *Schmidt's Jahrbuch*, 1887, No. 6, in the results of his use of this drug as a sedative:

Hyoscine, when given in large doses, is excreted as such by the kidneys. A small amount of the urine of an animal thoroughly under the influence of hyoscine, when dropped upon the heart of a frog which had been poisoned by muscarine, will cause the heart which was quiescent to beat. Hyoscine is thus an antidote to muscarine. In the same way, muscarine, by its stimulant power over the pneumogastric, will cause a heart to beat which had been stopped by hyoscine. The effect of the drug is the same upon the human subject as upon the frog. In the case of a patient with melancholia, whose pulse was slow, an injection of $\frac{1}{60}$ of a grain produced a very perceptible acceleration. In small doses, of $\frac{1}{120}$ to $\frac{1}{60}$ of a grain, hyoscine is a weak narcotic to healthy human beings.

Numerous observations made upon the large numbers of patients at the Dorpat Clinics for Insane Patients have proved its excellence as a reliable hypnotic, when given subcutaneously in doses of $\frac{1}{120}$ to $\frac{1}{60}$ of a grain of the hydrochlorate. A peculiarity of the use of hyoscine was the absence in the cases noted of all ill after-effects produced by the drug.

THE ADMINISTRATION OF OPIUM.

There are few drugs more commonly prescribed than opium, and it is certain there is none more abused or more carelessly combined. Of its numerous official preparations it cannot be said that their individual actions are free from the disagreeable after-effects which characterize that of the pure drug. The problem is to get all the good effects of the drug, and yet to obviate the resulting headache, sickness, and loss of appetite caused by arrestment of the secretions of the alimentary canal. This, of course, refers to medium doses. Belladonna or atropine have for long been given in combination with opium, but in these respects the result has been mostly a failure, the reason being that while the actions of these drugs on the central nervous system are to a certain extent antagonistic, their actions on the alimentary secretions are much the same. For some time DR. A. G. AULD (*Lancet*, July 16, 1887) has given opium in combination with ether with good results, ether being one of the most powerful secretion stimulants we know. He generally prescribes equal quantities of tincture of opium and spirit of ether, and though not claiming for this a specific effect, thinks it a good and most useful mixture.

A FORMULA FOR NAPHTHALIN IN PILL FORM.

BERNBECK has found that a pill covered with elastic collodion is especially useful in administering this drug. His formula is as follows:

℞ Naphthalini resublimat., 10 parts;
Rad. althææ pulv., 5 parts;
Mucil. gummi arab., q.s.
Ut. fiant pilul. 100.
Dry without heating, and cover with elastic collodion.
Sig.—Two or three pills three times daily.

The remedy is especially useful in gastro-intestinal catarrh.

The advantage of the collodion coating is found in the fact that it is dissolved in the intestine and not in the stomach, and that no unpleasant taste is experienced from gastric eructation. For the success of the collodion coating it is essential that the pills be carefully dried before its application.—*Deutsche-Amerikanische Apotheker-Zeitung*, June 15, 1887.

THE TREATMENT OF FRACTURES OF THE FEMUR.

DR. THIRIAR, in an instructive clinical lecture to the Brussels medical students on the treatment of fractures of the thigh, pointed out the advantages of the telescope apparatus proposed and described by Professor Derobaix some seven years ago. This consists, firstly, of a starch bandage reaching from above the knee to the foot, provided with a stirrup and a cord, which passes over a pulley, and has a weight attached to the end in order to keep up constant extension; and, secondly, of a femoro-pelvic starch bandage, which is applied two or three days after the first bandage, the upper part of which it covers so that the one may slide within the other in telescope fashion. When dry, the femoral portion is slit up. It can thus be opened and the seat of the fracture inspected at pleasure, and, if necessary, manipulated by the hands, while an assistant makes any required degree of traction on the leg. Afterwards it can be tightened up by straps and buckles, with which it is provided, and the limb is then absolutely protected against all lateral or see-saw movements, while the patient can be moved as is necessary for purposes of cleanliness without endangering the rigidity of the fractured limb. By this means Dr. Thiriar believes better results can be obtained than by any other apparatus; and he publishes a list of thirty cases, in all but two of which there was either no shortening or so little that it did not amount to a quarter of an inch. In one of the two unsuccessful cases the patient was excessively unruly, and in the other no amount of manipulation appeared to reduce the deformity when first seen.—*The Lancet*, July 2, 1887.

VOLKMANN'S ANTISEPTIC LIQUID.

Thymol, 1 part;
Alcohol, 10 parts;
Glycerin, 20 parts;
Water, 100 parts.

The above, as used by the German surgeon whose name it bears, is a useful formula for antisepsis by thymol.—*Deutsche-Amerikanische Apotheker-Zeitung*, June 15, 1887.

SALICIN IN THE TREATMENT OF SCARLATINA.

Salicylate of sodium and salicin have been highly recommended for the treatment of acute tonsillitis, when given early after a free purge, when the disease will with almost a certainty become arrested. If the tonsils have become swollen and hard, or if pus has formed, nothing, of course, will prove effectual, and the disease will run its course.

MR. W. P. MEHARRY writes to the *British Medical Journal*, July 2, that in scarlatina, especially in that known as scarlatina anginosa, salicin is of great value, and in those cases of simple scarlatina in which the disease is prolonged by the throat complication salicin immediately effects a cure.

Mr. Meharry generally gives to a child four or five years of age 5 grains of salicin every two hours until the temperature becomes normal. Afterwards the same quantity three times daily for a few days to prevent a relapse.

Reviews.

A TREATISE ON DIPHTHERIA HISTORICALLY AND PRACTICALLY CONSIDERED, INCLUDING CROUP, TRACHEOTOMY, AND INTUBATION. By A. Sanné, Docteur en Médecine, etc. Translated, annotated, and the surgical anatomy added. Illustrated with a full-paged colored lithograph and many wood engravings. By Henry Z. Gill, A.M., M.D., LL.D., etc.

St. Louis: J. H. Chambers & Co., 1887.

This is a very complete work upon diphtheria, leaving very little unsaid, and to which the surgeon as well as the practitioner can refer with the certainty of finding what he wants, if it is possible to find it anywhere.

Its leading chapter covers the ground of "Tracheotomy in Children." It is profusely illustrated with an excellent series of woodcuts, which are invaluable to the operator. The main portion of the book, devoted to diphtheria, embraces chapters on its localization, course, duration, and termination, recurrence, epidemics, nature, sequences, complications, prophylaxis, etc. In treatment the author views all specific lines of medication with cynicism. Tried by the cold glance of statistics they fail to do the wonders they promise. He does not believe in iron, in alkalies, in terebinthinate remedies; mercurials having been given, as he thinks, to diminish the fibrin in the blood, and the fibrin not being in excess, are, of course, absurdly useless, and, what is worse, dangerous. Support, restoration by food, alcohol, and local disinfection may do some good. Tracheotomy should be early done. The attendant should not wait for obstruction.

Intubation is carefully and fairly treated. The author evidently considers it as a proved and established procedure of great value. Full directions are given for the operative work of intubation, and the chapter is carefully illustrated for the needs of the subject. The book is a thoughtful one, and contains a mass of valuable information.

E. W. W.

OUTLINES FOR THE MANAGEMENT OF DIET, OR THE REGULATION OF FOOD TO THE REQUIREMENTS OF HEALTH AND THE TREATMENT OF DISEASE. By Edward Tunis Bruen, Assistant Professor of Physical Diagnosis, University of Pennsylvania; one of the Physicians to the Philadelphia and University Hospitals; Lecturer on Pathology in the Woman's Medical College of Philadelphia, etc.

Philadelphia: J. B. Lippincott Company, 1887.

To know what to eat and when to eat it is better than the possession of any extant elixir of life. Such knowledge is one-half of hygiene and one-half of medical treatment. Starvation slays many and gluttony more, but a wise diet protects a man from far more dangers than he dreams of.

To know a subject well one should master its general principles. To order a proper diet for one's self or another, we should understand the physiology of digestion. This our author gives us briefly in his chapter on "Points on the Physiology of Digestion." Another important matter is the varying diet required for varying age. The diet for the infant must differ from that suited to the mature or the aged. How it differs and why, we learn in the chapter on "Regulation of Food to the Requirements of Health in Different Periods of Life."

In "Liquids Used as Beverages" the author studies tea, coffee, cocoa, and the much-disputed alcohol question. "Certainly in health," he says, "or in chronic diseases, its use is for the most part undesirable as a food." "In advancing life it can be guardedly used." The contamination of water, and the value of pure water as a beverage, are briefly but carefully discussed. The fundamental principles of infant feeding are well explained in the chapter on "Special Plans of Diet," which is followed by one on the "Amount of Food required by the System." Chapter vi. tells us how to grow fat or lean, as we happen to need the advice, and the remainder of the book is devoted to "Diet in Special Diseases," in which the seeker can find many valuable hints, many

ways perhaps unthought of, but here suggested, which may prove of more value to the sick than any amount of mere drugging. In fact, the book is well worth owning.

E. W. W.

HANDBOOK OF PRACTICAL MEDICINE. By Dr. Hermann Eichhorst. Vol. III. and Vol. IV.
New York: William Wood & Co., 1886.

Vol. III. of the series of volumes composing this handbook is devoted to diseases of the nerves, muscles, and skin, Vol. IV. to diseases of the blood and nutrition, and infectious diseases. Throughout both volumes the student will recognize the same minute handling of all subjects which gives the work its great value. The chapters on diseases of the nervous system and muscles, especially, are profusely and excellently illustrated. Vol. IV. is, perhaps, more likely to interest the average professional reader. The section on diseases of nutrition opens with a chapter on "Obesity," which, in terse language, sums up the most recent views on this subject. The chapter "Diabetes Mellitus" is quite elaborate and gloomy, the author considering all remedies, apart from rigid diet, as of very uncertain efficacy. He makes no mention of the arsenite of bromine, and while doubting the value of opium in large doses, remarks that the reports concerning arsenic are "less favorable than those concerning opium." Duhring's claim to have cured a number of cases by pursuing a certain dietetic regimen he regards with derision. For salicylic and carbolic acids, as recommended by Ebstein and Mueller, he says, "We must experiment with these remedies, since different patients react differently," which will be taken by some as but one more instance of the German scientific method of regarding patients as only so many chemical combinations. In the chapter on "Rickets" the author advises lime-water, more animal food, fresh air, without urging the child to walk, cod-liver oil, and a bath of salt water.

Regarding scarlet fever, we find that the author endorses the view that the diphtheritic complications of the disease are manifestations of true diphtheria, for which scarlet fever "creates a predisposition," though the different clinical behavior of the scarlatinal from the ordinary diphtheritic membrane is noticed. With the exception of lukewarm baths, the author makes no special recommendation in treatment.

Rötheln, which the author uses as synonymous with rubeola, the author considers as a distinct infectious disease independent of measles or roseola. The diagnosis from measles, scarlatina, and roseola "is not always possible." For erysipelas the best local application, in the author's opinion, is carbolic acid dissolved in turpentine, ʒss to ʒi of the latter, applied every hour. When gangrene occurs the parts should be dressed with acetate of alumina, one or two per cent. solution. The only internal remedy mentioned besides enemata of antipyrin is potassium iodide, gr. vii, every two hours.

The author gives herpes of the pharynx and larynx a definite description, which could be read with profit by several recent writers. He has found the vesicles in one case by the laryngoscope on the posterior surface of the uvula.

Under the caption of "Sweating Sickness" he describes miliary fever, directly tracing it back to the historic epidemics of the disease from the fifteenth century. It appears in epidemics, generally in summer, and is "an independent infectious disease." Under the subject of vaccination the author has written a very valuable chapter. The author advocates humanized virus, makes light of any danger, if properly selected, and considers that by the use of bovine virus, among other dangers, there is incurred a considerable one, —of the introduction of tubercle. All animals from whom lymph is taken for human use should be killed and examined carefully. When vaccination is followed by the appearance of "pock-like vesicles over the entire body" it is due to "accidental combination with varicella." In the chapter on "Cholera" the author expresses his belief in quarantine of the strictest character. In the treatment of this disease he recommends rest, very little food, weak broth, and a combination of ipecac and calomel every three hours. Venereal disease and tubercle and diphtheria occupy the remaining portion of Vol. IV. Taken as a whole, the "Handbook of Practical Medicine" is a work of great value, and the publishers are to be especially commended for placing it in its accessible and cheap form before the medical public.

E. W. W.

A MANUAL OF WEIGHTS AND MEASURES, WITH RULES AND TABLES. By Oscar Oldberg, Pharm.D. Second Edition.
Chicago: Charles Johnson, 1887.

A knowledge of the metric system is becoming every day more and more essential to enable one to keep abreast with the progress of medical science. A great proportion of

recent discoveries first appear in continental literature, where, it is needless to say, the metric system is now solely employed. In the majority of abstracts of foreign papers, on which physicians who, unfortunately, are ignorant of French and German are compelled to rely, as a rule, the metric system is reproduced. In the GAZETTE we make it a point to transpose the quantities from the metric to apothecary's measure, giving the figures in both systems, but it is evident that such translations of the metric system can only be approximate unless we run into complex fractions, and sometimes these translations may be overlooked. We have, in the columns of the GAZETTE, several times furnished our readers with tables for the convenient conversion of the different systems of weights and measures, but for an extension of the subject we would refer to Dr. Oldberg's book.

Dr. Oldberg's treatise on metrology includes in a compact space everything pertaining to the subject which can be of necessity. It contains the elements of metrology; the relations between metrological systems and arithmetrical notation; a brief review of the development of weights and measures; the demands of practical medicine and pharmacy in the matter of subdivision of the units employed; the metric system; American and English weights and measures; the relations of weight to volume; specific weight; specific volume; the construction, use, and preservation of balances or scales, weights and measures, and of alcoholometers, urinometers, and other hydrometers; and extensive tables of equivalents; while the application of weights and measures to prescribing and dispensing, and to the construction of formulæ for liquid preparations, have received merited careful attention.

Correspondence.

LONDON.

(From our Special Correspondent.)

We are now enjoying one of the most beautiful summers we have had for years in England. Nothing in the way of weather could have been more fortunate, for we have resigned ourselves during the past fortnight to the delights in connection with the jubilee of our gracious queen. Summer in England is a season when visitors, whom we have in such numbers at present, may study this people with profit. The Anglo-Saxon race gives full play to some of its leading characteristics in the lovely evenings of June and July. From the youngest to the oldest all are out of doors and enjoying themselves in the thoroughly national or racial fashion of taking laborious exercise. Every village green is at this moment covered with cricketers; every lawn is the scene of an earnest contest at tennis. I often ask myself what our neighbors across the Channel think of all this. I know how amazed Orientals are to see our brothers in India and China taking violent exercise in the sun as the most enjoyable of pleasures. I wonder how far our friends on the other side of the Atlantic yield to the same manly enticements. And all this is often before my mind, because I cannot help connecting the health of our English people, and their position on the earth, with their undying love for robust sports. Nothing seems too much for our boys in the way of muscular expenditure. Thousands—very likely tens of thousands—of bicycles and tricycles must carry their riders out of London every Sunday. Thousands of us spend Sunday on the Thames,—anywhere within fifty miles of the metropolis. I can imagine that when you read of our regattas and cricket-matches you may conclude that our boys take to the same forms of amusement to copy their seniors. The order is just the reverse: our famous oars- and batsmen have grown out of youngsters who took to boating and cricket with their companions as soon as they were breeched! These are our national games and occupations. A master who cannot play cricket creditably stands a poor chance of election to a post in a public school, however distinguished he may be as a scholar or mathematician.

Now it appears to me that all this has a more than ethnical interest to us: it bears upon the pathology and the therapeutics of the diseases which we, as medical men, are called upon to study and to treat. We hear very much at the present time of change in the type of disease. We are told that disease is now less "sthenic" and more "neurotic;" that nervous disorder is greatly on the increase, and that even in nervous disorder the type is changing,—that lunatics are now mainly melancholic and less often maniacal; that the maniacal cannot bear depressants, but recover under sustaining nutritive treatment. No doubt there is much truth in all this. No other result could well be expected to follow the change of thought, of labor,

and of surroundings wrought by the railway and the telegraph. But I believe our fears are greatly exaggerated. Whilst we have a lamentable number of break-downs in a nervous direction, the backbone of our population may be complacently regarded as healthy and of well-balanced constitution. Boys and girls, men and women alike, they show no sign to any eye of national degeneration. The feminine sex are in their way as active as their brethren. Tennis has been nothing less than a national blessing in the effect it has had in bringing women out of doors and keeping them active and happy for hours in the fresh air. A week ago a Scotch girl was Senior Classic at Cambridge,—for the first time in history a woman carrying off the highest classical instruction of the year. Do not interpret this event, if you please, to mean that our daughters are all taking to Greek and Latin. This week we are scanning with equal interest and excitement the report of the progress of the tennis tournament at Wimbledon, where ladies figure very largely. My belief is that whilst those of us who do suffer and break down may do so more in a neurotic direction than was the case fifty years ago, the actual number of the sick and the delicate is actually less. This is a fact about which I believe there can be no doubt; but it is a fact that appears to be overlooked by those who harp upon the decline of the English people. Its bearing is to be traced also in treatment. Nervine tonics are all very good in their way, but we are returning here to common sense and calomel, and getting better results than we got a few years ago from quinine and strychnine. Venesection and tartar emetic may never come again to be our sheet-anchors in fever, but we have lived to see it proved—though as yet not practically confessed—that our so-called nutritive system of treatment in typhoid, beef-tea and jellies, is little short of a system of starvation, and yet wonderfully successful.

Sir John Lubbock, whose name is familiar to your readers as at once a distinguished *savant* and politician, to whom the very class of whom I have been speaking—the young working population of our cities—owe their precious bank-holidays, has just been delighting us with his views on certain points connected with our profession. Improving the occasion of the distribution of prizes at Charing Cross Hospital last week, Sir John reminded his audience that medical treatment as now taught and practised is by no means so "natural" as most of us seem to regard it. It is at first sight scarcely conceivable that there are other ways of treating disease than for the doctors to bring patients under the influence of well-understood natural forces, whether medicinal or non-medicinal. But in truth the very opposite method is practised in some parts of the earth, and probably was practised here and with you in earlier—indeed not very remote—times. Under this system the doctor swallows the physic, the patient not. The physic works upon the medicine-man and enables him to exorcise or otherwise combat the evil spirit that haunts or possesses the sufferer. As Sir John Lubbock wittily remarked, this system may be all very good in uncivilized countries, but it is not likely to commend itself as pleasant, practicable, or profitable to us who covet an extensive practice, and who might not recover with sufficient rapidity from the successive doses to sustain a popular reputation. Truly, from strange beginnings and by an interesting process of evolution has our present therapeutics been perfected.

I find the recent numbers of the GAZETTE furnished with valuable reports of M. Bergeon's treatment of phthisis as it is practised in the States. We hear less of the system with us than one might have expected, considering the prominence given to it at first. In England it must have been received with distrust, for it created no enthusiasm. As a matter of fact, I have been told more about the value of gaseous enemata by friends returning from the continental stations than I have learned from the staffs of our different hospitals for consumption. Very different have been the opinions thus expressed to me. In the Alps, at Davos, to wit, the results have been anything but encouraging, and the estimate of the value of the system given me a few weeks ago by one of the most distinguished practitioners of that place was decidedly unfavorable. *Per contra*, one of the best known English physicians on the Riviera assured me the other day that he had seen unquestionably good results from the Bergeon enemata. The sulphide of carbon, which I understand M. Bergeon now recommends, is said to be not altogether safe, and must not be employed in the somewhat casual routine fashion prescribed by some of our French *confrères*. It is evident there is but one way of settling this question,—by hard facts. I can see no *a priori* reason for the employment of sulphuretted hydrogen in phthisis,—certainly none for its administration *per rectum*, for we know nothing of the effect of

the liver upon hydrosulphuric acid conveyed to it in the portal blood,—an action on which M. Bergeon appears to have forgotten to reckon. The results of carefully observed cases ought to be the only argument admitted. As for the effects of this method on asthma, that is another matter,—a matter of treating a highly complex neurosis by a novel, startling method which is certain to have a temporary success.

In one of my letters to you I referred to Mr. Victor Horsley's operations on the brain, and mentioned a case of cerebellar tumor which had been removed,—unfortunately, without good result. I have now to chronicle an extension of the surgical treatment of disease of the central nervous system in a direction which was plainly indicated by all our recent knowledge in this province of pathology. A week or two ago Mr. Horsley removed a tumor from the spinal cord with complete success at the time, and, I trust, with ultimate relief of every symptom. We are now so well acquainted with the symptoms of tumor of the cord and its meninges, that there can be no doubt this operation will be speedily repeated, and, indeed, come to take its place among the legitimate and most successful of surgical procedures of the first magnitude.

Since the publication of my letter of June we have had the publication of the report of the committee on Pasteur's method of treatment for the prevention of hydrophobia, the principal points of which I correctly anticipated. The pronouncement of the committee in favor of M. Pasteur has been heartily welcomed by the English press, both lay and professional. Before many days are over I have little doubt but the government will be asked what practical use they intend to make of the finding of the committee,—a finding which, if it do not express a recommendation of the establishment of a Pasteurian institute in London, certainly suggests that our government ought to provide the means of immediate inoculation to the unfortunate victims of rabid animals much nearer home than Paris. Let us hope that the vaccination department of the Local Government Board may at once take this matter up and put the method into practice.

PARIS.

(From our Special Correspondent.)

Is alcohol incompatible with pepsin? is one of the many questions of therapeutics that has most divided chemists and practitioners, and has caused the greatest divergence of opinion. The controversy is of perhaps fifteen years' standing, if not more, for some thirteen or fourteen years ago it was already discussed by Mr. Phillipp, before the Alumni Association of the New York College of Pharmacy. The Paris Société de Thérapeutique, an association including both physicians and pharmacists, recently gave the question another overhauling, the conclusion of which may fairly be said to be that alcohol is and is not incompatible with pepsin, according to circumstances. Dr. Bardet, Dr. Dujardin-Beaumetz's *chef de laboratoire* at the Cochin Hospital, led the discussion with an elaborate paper, well supported by experiments, and gave it as his opinion that up to twenty per cent. of alcohol is a proportion that pepsin solutions can stand with perfect impunity. Above twenty-five and up to seventy per cent. the loss of digestive power is in exact proportion with the excess of alcohol introduced. Above seventy per cent. the ferment is killed, just as albumen is suddenly coagulated at a certain temperature. This property explains the inertness observed by M. Catillon in specimens of pepsin precipitated by alcohol from glycerin or watery solutions. As to the loss occurring when wine is used as a solvent, it should be attributed to the tannin, not to the alcohol of the menstruum. M. Pierre Vigier partly agreed with Dr. Bardet, his own experiments having convinced him that eighteen or twenty per cent. of alcohol does not seriously impair the digestive ferment, although its power be somewhat injured. For this reason the revisers of the French Codex were right in admitting to the official list, notwithstanding Dr. Vulpian's opposition, wine and elixir of pepsin, two excellent preparations. But Dr. Bardet maintained his position; his experiments are conclusive, and prove that a proportion of alcohol not exceeding twenty per cent. has no untoward effect on pepsin, and it is only when twenty-five per cent. is reached that the ferment begins to be injured; the same result may be accidentally produced when alcohol is too rapidly added to solutions of pepsin, because then a portion of the digestive ferment may come into contact with a destructive proportion of alcohol.

French physiologists appear to concur in the opinion that strychnine is one of the poisons that patients do not become accustomed to. In other words, *one never gets used to strychnine.* It is true cases are on record in America in which considerable doses of the

alkaloid have been taken without harm, but these occurred with alcoholic persons, and therefore under peculiar physiological conditions. At a recent meeting of the Société de Biologie, Dr. Chouppe, after relating experiments on dogs, concluded that the economy never becomes habituated to strychnine. For instance, the same dose was administered for seventy-five days in succession, and always had exactly the same effects on the animal, while any slight increase of quantity in the mean time brought on grave accidents. Dr. Brown-Séquard entirely agreed with this opinion, a conclusion he had reached himself long before. A patient will take with impunity doses of strychnine very closely approximating the quantity sufficient to cause convulsions, or at least contractions. But once this point has been reached, the slightest possible increase of dose will be followed immediately by a general tetanic state. Hence we find neither an acquired habit nor accumulation accidents. He had also observed that strychnine is more rapidly absorbed on certain days than others, even when the precaution is taken to administer it after meals. Yet he thought French physicians are too timid by far in exhibiting strychnine, as it can be exceedingly useful in cases of organic paralysis, medullar affections, certain forms of chorea, etc., provided it be administered in nearly convulsivant doses. The two extremes to be avoided are, on one side, insufficiency, and, on the other, too rapid an increase of the beginning dose.

Acetanilide useless in Epilepsy.—When a new medicament is discovered it is often apt to be overestimated. For this reason, next to knowing what a substance is good for, perhaps the most important is to learn in which cases it is useless, or worse. Owing to its general therapeutic properties, Dr. Faure, of the Bicêtre Hospital, was led to administer acetanilide (antifebrin) for epilepsy, in Dr. Deny's service. The report which he has made is decidedly unfavorable. The patients, five in number, were treated for two months and a half, and carefully observed two months after the medication had been suspended. The medicine was given in increasing doses from 50 centigrammes to 2.50 grammes (8 to 40 grains). The patients while under treatment were affected with some of the symptoms already known, and more especially with cyanosis of the extremities and face, which would never fail to appear after two days, and rapidly disappear when acetanilide would be withheld. As regards therapeutic effects, they have been absolutely nil. Far from improving, four of the patients out of the five experienced many more fits during the treatment than within the same time before. Three of the patients even had the number of fits almost doubled. It may be that some coincidence has affected the results, but it must be confessed they are really far from encouraging.

Medical Jurisprudence.—French courts hold that between a physician and his patients an implicit agreement exists respecting the fees, which cannot be changed without explicit notice. A recent case in which the jurisprudence was applied was as follows: Mme. L. was in the habit of being attended in her confinements by Dr. N., and every time one hundred francs (twenty dollars) was the fee paid and accepted. Lately, after requiring Dr. N.'s medical attendance under the same circumstances, she was served with a bill for forty dollars, which she refused to pay. Dr. N. had, it seems, risen in the world, and thought his services worth twice as much as before, while Mme. L. contended she had received no notice of the increase, and was not therefore liable to pay more than usual. The court of Paris gave a judgment in favor of the patient, affirming the well-settled principle that if a physician has a right to enhance his scale of fees whenever he sees fit, he should give notice of the fact to his regular patients, to enable them to either have his attendance on the new conditions or to call in another physician.

Morphinomania, the fashionable vice of the period, scarcely less baneful than the more popular alcoholic intoxication, may, perhaps, not attract much public notice. But it is a mania of much concern to the medical profession, the more so that they often feel they have been the cause, direct or indirect, of the morphine-habit contracted by their patient. Many are the cures suggested for the evil; some are probably good, still, prevention is better, and Dr. Germain Sée, acting with this end in view, in a paper read before the Academy of Sciences has frankly proposed *antipyrin as a substitute for morphine*, whenever the physician only wishes to allay pain, and expects nothing more from the usual therapeutic effects of the opium alkaloids. He gives antipyrin in hypodermic injections, half a gramme of the substance with half a gramme of water to fill a Pravaz syringe. The injection is administered in the same manner as morphine; and after a short period of unpleasant tension the pain, whatever may be its cause, is greatly relieved, without the

sleepiness and the artificial, pleasant excitement which frequently leads to the morphine-habit. Besides, antipyrin often possesses a curative effect lacking in morphine. Many cases of articular and muscular rheumatism, acute and chronic gout, neuralgia, zona, lumbago, etc., successfully treated with antipyrin were detailed by Dr. Sée; but as morphine would have not been contraindicated with such patients, the main advantage was that the physician would feel his medication had not led a fellow-being to become a morphinomaniac. In other complaints, however, morphine is distinctly harmful, and antipyrin should be substituted. With patients suffering from biliary calculi, for instance, the administration of morphine has, it is true, a sedative effect on hepatic colics, but it has also the inconvenience of decreasing biliary and intestinal secretions, thus interfering with the flow of matters, and supplying the occasion for more suffering. Antipyrin, on the contrary, rapidly stops the pain without causing any visceral disturbance. The same is true of nephritic colics; they are relieved, with the important advantage that the flow of urine is not decreased, while morphine, by suppressing the urinary secretion, is liable to bring on grave complications. For painful affections of the heart and angina pectoris antipyrin is indicated as a substitute for morphine in injections, because it is equally effective, at least, and causes no cerebral disturbance. When given for asthmatic oppression and suffocating fits, antipyrin cures the patient without suppressing the bronchial secretion. In all the foregoing instances the superiority of antipyrin is therefore well established, but in all cases it has a considerable advantage over morphine. As it does not afford the patient the peculiar inebriating sensations sought by opium-eaters, it is not liable to make of him a morphinomaniac, and relieves his pain quite as effectually as morphine does. To conclude the chapter on the new chemical favorite, Dr. Chouppe, in a communication made to the Paris Society of Biology (July 16), recommended *antipyrin in uterine colics.* He administers 1 gramme of it in a rectal enema, with the best results. In one case of severe uterine griping after accouchement, the dose had to be repeated in the course of a few hours, but the pain was permanently relieved. In another instance, a patient suffering from most intense colics on each periodical return of menstruation obtained complete and permanent relief a quarter of an hour after being given an enema of antipyrin. Formerly she had to be treated with large doses of laudanum, or enough chloral hydrate to produce sleep. From Dr. Chouppe's experience it would appear as if antipyrin could also be substituted for chloral hydrate, a medicine that is liable to be perverted into an intoxicant quite as readily as morphine is. In fine, there seems to be much praise now bestowed upon antipyrin. But we may soon expect to be shown the other side of the medal, with, probably, a tendency to run into the opposite extreme.

PARIS, July 22, 1887.

BERLIN.

(From our Special Correspondent.)

The medical life of our national capital is for a time at rest. Professors and students have departed for their summer vacations. The rooms of the medical societies became too warm for even their most eager attendants, therefore the last meeting has been held, and now it is quiet until September, and, after all have recuperated themselves at baths or in the country, the great meetings of the Naturalists and Physicians, the Vienna International Congress for Hygiene and Deniography, will make the centre for all who possess a mind for scientific research and enable them to unite in their work. A number of German medical celebrities intend to undertake the trip across the ocean in order to attend the International Medical Congress in Washington. The interest, however, will not be very general; not on account of the expensive and long journey, for the majority of our leaders in medical sciences have a very widespread and profitable consulting practice, but in the leading German circles there is greater interest and sympathy felt with the originally appointed and arranged committee in Copenhagen than in that which was substituted later; and, besides, the Berlin Medical Society, which gives the tone to these things, decided at its last meeting not to send an official delegation to Washington. In this decision one may perceive the sensitiveness which the delegates to the Congress in Copenhagen felt in consequence of certain precedents which the *Chauvanism* of the French members caused. We can only regret that such questions should be brought within the circles of science, and with this feeling wish that the attendance of German scientists at the Congress at Washington may be a large one, without regard to personal questions or national sensitiveness.

If I am to inform you of the circumstance which is causing the greatest interest in medical as well as non-professional circles, I must tell of the illness of the crown prince of the German empire. It is well known through the daily press of America that since January of this year the crown prince has been suffering from a hoarseness. Early in March, Professor Gerhardt discovered a swelling on the left vocal cord, which was treated with galvano-caustic. As neither this treatment nor a cure at Ems brought any visible improvement, the anxiety arose among the physicians who were called in that there might be a malignant growth, and the question of an external laryngeal operation arose. Professor von Bergmann, who was chosen as operator, would not, however, assume the responsibility of so difficult an operation until every means had been used to remove the swelling by internal laryngeal treatment. Therefore the English specialist, Morell Mackenzie, was called in consultation, and, fortunately, he was successful in three visits in removing three pieces of the swelling, which was sufficient to establish the nature of the disease after an examination. Virchow, to whom was intrusted the examination, as being the most competent in such matters, stated in his opinion, published in the German medical journals, that the swelling is a papillary growth united with epithelial proliferation,—pachyderma verrucosa,—and gave a favorable prognostication.

The crown prince is at present under Dr. Mackenzie's treatment, and English journals announce that his recovery is progressing favorably. It is a curious coincidence that just at the time that the crown prince is under the treatment of an English physician, in the Berlin medical faculty the most competent professors of rhinology and laryngology are establishing a clinic and polyclinic under the direction of Professor Bernhardt Fraenkel. This extension of the clinical institutes of the Berlin faculty is the creation of the Prussian kultusminister, Dr. von Gossler, to whose warm interest for the medical standard and medical instruction in the Prussian universities we are indebted for a large number of beneficial innovations.

One of the latest arrangements which is of importance to the medical clinics is the issuing of a clinical annual register, which was ordered by the ministry on the twenty-first of May of this year. This annual register will contain a condensed account of all medical clinics and polyclinics held by the ten Prussian universities, giving information as to their accommodations, their usefulness as institutions of healing, as institutes of instruction for the training of physicians, and as institutes for the increase of the knowledge of medical science, and besides, exhaustive statistical specifications of nosology, etc. When one considers that the Berlin University possesses no less than nineteen clinical institutions, one will be able to form some idea of the importance of this literary undertaking authorized by the government. If scientific medicine required it, the physician's position has lately received in Prussia a noticeable encouragement, and it receives a certain official recognition and co-operative assistance in all questions relating to the general health. In each province, through the choice of the physicians, a so-called committee of physicians is elected, the duty of which is to attend to all affairs connected with the medical profession, and to which all complaints and opinions must be brought. Through this the physicians obtain great influence in many matters in which they alone are competent, and, on the other hand, the government obtains a stronger position through the co-operation of the medical profession in all matters pertaining to hygiene. From this we are led to suppose great results will follow.

After all these communications of a general nature we must give a few therapeutic notices. W. Lublinski introduced a patient at the meeting of the Berlin Medical Society whose extreme stenosis of the trachea was greatly benefited by the catheterizing of the windpipe. The patient in his second year was tracheotomized on account of diphtheria. Since then he suffered with asthma, which gradually increased so that at his nineteenth year his inspiration was excessively labored, and audible at a considerable distance.

The examination of the trachea with the mirror showed in the neighborhood of the eighth tracheal ring a contraction across the trachea measuring four millimetres; particularly on the right was a strongly developed tendency to stenosis to be noticed, which contributed to the contraction of the trachea at this point. This point corresponded with the external tracheotomical cicatrix. It was therefore one of the rarest cases where the stricture of the trachea was not caused by syphilis, as was shown by the material changes in the spot referred to. The treatment was as follows: gradual dilatation of the contracted spot by an elastic catheter; beginning with a catheter of the size of four millimetres,

after eighteen applications the size had increased to 1.2 centimetre; as the ordinary catheters were not of sufficient size, Lublinski used conical rectal bougies; already after the fourth catheterizing the contraction was remarkably less, and after the eighteen applications the patient was entirely cured of his infirmity. In the same manner Lublinski has treated four other cases.

In one case of syphilitic stenosis of the trachea, where below the vocal cords a diaphragmatic membrane appeared, he succeeded, after dividing the membrane by the insertion of the bougie, only in partially increasing the opening, because the patient withdrew from the treatment after his oppression had been relieved. In two cases of rapidly-growing goitre, he succeeded in relieving the occasional asthmatic oppression entirely; also in one case of parenchymatous goitre, with severe compression of the trachea by the isthmus, his treatment was successful.

Professor Ewald has attempted to use salol for diagnostic purposes. It would be possible to decide the time at which food goes from the stomach into the intestine if one could introduce substances into the stomach which would not dissolve there, but would quickly be dissolved in the intestine, and which would be rapidly evacuated and passed through the urine. Salol will not be dissolved in the stomach, as it is insoluble in water, and belongs to the warm, oily substances.

According to Nencki and Sahli, salol divides itself, through the influence of the pancreas, into salicylic acid and phenol, and it was, therefore, quite natural to attach these bodies to the decision of the question as to how quickly matters pass from the stomach into the intestines if one could observe changes in the functions of the pancreas. In a number of demonstrations it was firmly established that salol does not divide itself in the stomach, but the action of the pancreas could not be brought in question; then salol divides itself in the gastric warmth into quite weak alkaline solution; it even appeared that artificial preparations of the pancreas had a retarding influence upon the dissolution of the salol. In the same way the mucous membrane of the alimentary canal, as far as it does not acidify, is in condition to decompose the salol so that it seems to be destroyed by the tissues; it shows that in all healthy individuals salol decomposes in from a half to one hour, and could be recognized in the urine as salicylic acid. Out of thirty-nine experiments, in only one the salicylic acid appeared after one hour, in six after a half-hour, and in all the others after three-quarters. In opposition to this in individuals in a normal condition, in eight cases of typical dilatation of the stomach the salicylic acid reaction appeared; in seven cases only after two or three hours in the urine; in the eighth case, where the diagnosis could not be decided in all directions, the condition seemed normal, and for this reason Ewald decided that the diagnosis in this case was questionable. The prolongation of the dissolution of salol by the dilatation of the stomach seems to be so typical that the late appearance of the same is calculated to influence the diagnosis of the disease, and, in fact, has influenced it in two cases.

At the last meeting of the Southwest German Association of Neurologists and Physicians for the Insane, which took place at Frankfort-on-the-Main, Professor von Mering announced that he had found a most valuable anæsthetic in amyl-hydrate (tertian-amyl-alcohol); that he has tried the same in sixty cases of insanity, paralytics, and melancholia, insomnia caused by nervousness, and in feverish diseases; a dose from 30 to 75 minims, sleep lasting from six to eight hours; no bad results; the taste is pleasant as that of paraldehyde. Von Mering gives this formula:

℞ Amyl-hydrate, ʒi;
Aquæ dest., ʒx;
Ext. liquirit., ʒi.

Dr. Faust (Dresden) recommends in the *Deutsche Med. Wochenschrift* antifebrin in doses from 0.5 to 1 gramme for headache. He noticed upon himself that migraine which defied all other remedies disappeared entirely in from half an hour to an hour's time after one of the above doses; he has obtained the same results in many other cases.

"SNAKE-BITE WEED."

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—I send you by this mail a plant which grows here. It is known as "snake-bite weed." It is regarded as a specific among the natives for the bite of any and all of our poisonous snakes. It has been used by the laity in many cases, in the form of a decoction made by boiling the leaves with sweet milk, and in every case with the most happy results. A few years ago, in our county of Gibson, Dr. A. E. Turner, of Yorkville, Tenn., was treating a case of snake-bite after the most approved methods. The pa-

tient was failing rapidly; had been bitten by a "cotton-mouth" (if my memory fails me not). The family asked permission to send for a man not far off, who was known to be able to cure snake-bites. Dr. Turner consented. The man came, hunted up the weed of which I send you the specimen, took a handful of leaves, poured on a pint of boiling milk, and as soon as cool enough to administer began with it. He administered the infusion in copious draughts, using several pints. Result: rapid recovery in less than twenty-four hours of what promised to be a fatal case of snake-bite.

At the last meeting of the Gibson County Medical Society, held June 21, 1887, Dr. Stephenson, of Dyer, this county, reported a case he had treated of snake-bite a short time previously, in which alarming symptoms rapidly presented themselves. He gave morphine to allay the pain, and then trusted exclusively to the infusion prepared from this weed, as above described. From the very commencement of the infusion the patient began to improve, and in twelve hours was well. He used no alcohol in any form in his case. It is claimed that it acts more slowly in those cases in which whiskey has been used than where it has not been given.

It is stated that persons bitten by snakes, after tasting the infusion, crave it as long as the snake poison is active, but that as soon as counteracted they no longer desire it. I do not know the plant, hence send it to you to inquire what it is. I do not attempt any description, as you will have the plant before you. I do not know of its having ever been administered in bites of rattlesnakes, but in all of our other poisonous snakes.

The facts that I have stated can be vouched for by many reliable citizens and physicians. What is it, and in what do its virtues consist?

Yours very truly,

T. J. HAPPEL, M.D.

TRENTON, TENN.

[A very large proportion of men and larger animals bitten by poisonous North American serpents recover as a matter of course. If they have chewed any weed as a curative measure (which they usually do), no matter what worthless plant it may be, they attribute their recovery to said plant. Thus it happens that every section, almost every village, civilized and savage, throughout the world, has some plant that is spoken of exactly as our correspondent speaks of this. A mere list of the names of such plants would fill a good-sized book. Such as have been examined have been found to be more or less inert, this being one of those that has been so investigated.

We have referred the specimen to Dr. H. H. Rusby, who informs us that it is *Hieracium*, probably *Hieracium Gronovii*, L., and from time immemorial has been known as "rattlesnake plantain," because it was supposed to be able to cure the bites of rattlesnakes.—EDS.]

A NEW REMEDY FOR NIGHT-SWEATS.

To the Editors of the THERAPEUTIC GAZETTE:

SIRS:—A regular physician myself, yet I have endeavored through my professional career to take anything which is useful in the practice of medicine from any other branch of medicine, believing, as I do, that so-called allopathy is or should be true eclecticism. We should cull from all; the mineral and vegetable kingdoms belong to us, and we should not reject a medicine simply because its effects were first discovered by an eclectic, a homœopath, or even by a person not belonging to any school. We should remember that the *abuse* of aconite by our profession a hundred years ago caused the profession almost to quit the use of it until the sect of Hahnemann commenced to use it in small doses with good results. This taught us that we had abused it, and as a consequence we commenced its use again, in smaller doses than before, adopting a middle ground between former practice and homœopathy, and now what member of our profession would be without it as a remedy in many diseases?

Did we not gain some information here from another sect? Should we be ashamed to acknowledge the benefit? Surely not. I have been often of late years amused, when some new native remedy has been given to the profession, to turn back to King and find that he had used and recommended the same remedy years before. A few years ago *Phytolacca decandra* was brought out as a remedy for mastitis. King had used it and recommended its use years before. We all know the history (as given in the U. S. Dispensatory) of the discovery of gelsemium as a remedy in fever by an old planter in Mississippi; yet our profession ignored its use until we were *forced* to use it by the success of the eclectic with it. Just so with one of the most valuable of our remedies in the treatment of the diseases of females, *Viburnum prunifolium*, although Dr. Phares, of Mississippi, called the

attention of the profession to it in an article published in *The American Journal of the Medical Sciences* in 1852. Until a few years ago our profession would not use it, and yet the eclectics have used it for years, and King, in the edition of his work published in 1870, recommends its use. I might go on until I would tire the patience of your readers giving similar instances, but these are sufficient to effect my purpose, which is to cause the profession to stop and think for themselves, and to resolve to take that which is good from any source, having the moral courage to "render unto Cæsar that which is Cæsar's."

I desire to call the attention of the profession to a vegetable remedy, native to our soil, for that troublesome accompaniment of wasting diseases, night-sweats. Do not throw this article aside with the exclamation that "atropine is good enough for me." Atropine is a good remedy, and in the majority of cases answers the purpose; but atropine is a very strong medicine, and must be used with great care. A simpler medicine, answering the same purpose, would certainly be better. I have it, and shall give it to you, and at the same time I shall tell you that it is not a discovery of mine. King recommends it, but I did not get it from him; *I got it from an old negro*,—from the same source that the profession got gossypium. If you can take that from them, why not take this, coming to me from the same source? The remedy is one indigenous to the whole country; it is therefore within the reach of us all; it is the cinquefoil, *Potentilla canadensis*, called by some botanists *Potentilla sarmentosa*. I have stopped night-sweats with it when *atropine failed to relieve*. It is pleasant to take; when drawn it has an agreeable odor, much like table-tea. The manner of preparation is to pour boiling water on a handful of the vine, leaves, and root. Let the patient drink *ad libitum*.

I hope that the members of the profession will give it a fair trial, and report the result through the columns of your valuable journal.

A supply can be obtained through the Southern purchasing agency of Messrs. Parke, Davis & Co., Charlotte, N. C., or through Messrs. Wallace Bros., Statesville, N. C., or, if not too busy, about your own homes. I hope that some manufacturing chemist will (should I be found to be correct in my estimate of it) give to the profession a fluid extract of the root and plant.

Yours truly,

SAMPSON POPE, M.D.

NEWBERRY, S. C., June 14, 1887.

TREATMENT OF EPISTAXIS.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—I have read for a good many years articles on epistaxis in many journals, and from apparently able writers, and have been a good deal surprised at the different ways recommended by the aforesaid writers regarding its suppression.

Now, it is a well-known fact to anatomists and others that the hemorrhage in the vast majority of cases proceeds from the septum nares, and is supplied by a branch of the superior coronary, a branch of the facial, which ramifies upon the septum nares. It enters the opening of the nose just below the alæ nasi, crossing the superior maxillary bone at that point.

Now, in a practice of nearly thirty years, I have had many cases of epistaxis, and have never in a single case failed to arrest the bleeding by compression of the aforesaid artery, with the finger applied over its track, making firm pressure against the bone. This will arrest the bleeding nine hundred and ninety-nine cases in a thousand. I have been called to see cases where other physicians had plugged the nostrils, and injected solutions of ferri persulphas, ice-water, etc., without benefit, and have at once arrested all hemorrhage instantly by the above simple means. Tell them to try it.

Yours truly,

J. ROBINSON, M.D.

MANHATTAN, KAN.

Notes and Queries.

THE REPORT OF THE ENGLISH COMMITTEE OF INQUIRY INTO PASTEUR'S TREATMENT OF HYDROPHOBIA.

The value or uselessness of Pasteur's inoculations for the prevention and cure of hydrophobia have called forth so much controversy that we deem no apology necessary for laying before our readers an abstract of the report on this subject signed by Sir James Paget, T. Lauder Brunton, Dr. Fleming, Sir Joseph Lister, Dr. Quain, Henry E. Roscoe, Dr. Burdon Sanderson, and Victor Horsley, with the editorial comments published in the *Lancet* on this report on July 7, 1887.

The report commences by stating that it was found necessary that some of the members of the committee should, together with Mr. Victor Horsley, the secretary, visit Paris so as to obtain information from M. Pasteur

himself, to observe his method of treatment, and investigate a considerable number of cases of persons inoculated by him; and, further, that a careful series of experiments should be made by Mr. Horsley on the effects of such inoculation on the lower animals. Mr. Horsley's experiments are stated to entirely confirm M. Pasteur's discovery of a method by which animals may be protected from the infection of rabies. If a dog, rabbit, or other animal be bitten by a rabid dog and die of rabies, a substance can be obtained from its spinal cord which, being inoculated into a healthy dog or other animal, will produce rabies similar to that which would have followed directly from the bite of a rabid animal, or differing only in that the period of incubation between the inoculation and the appearance of the characteristic symptoms of rabies may be altered. The rabies thus transmitted by inoculation may, by similar inoculations, be transmitted through a succession of rabbits with marked increase of intensity. But the virus in the spinal cord of rabbits that have died of inoculated rabies may be gradually attenuated by drying the cords, so that after a certain number of days' drying it may be injected into healthy rabbits or other animals without any danger of producing rabies; and by using on each successive day the virus dried during a period shorter than that used on the previous day an animal may be made almost certainly secure against rabies, whether from a bite or from any method of subcutaneous inoculation; and this protection is proved by the fact that if animals so protected and others not thus protected be bitten by the same rabid animal, none of the first set will die of rabies, and, with rare exceptions, all of the second set will succumb.

It may hence be deemed certain that M. Pasteur has discovered a method of protection from rabies comparable with that which vaccination affords against infection from smallpox. It would be difficult to overestimate the importance of the discovery, whether for its practical utility or for its application in general pathology. It shows a new method of inoculation, or, as M. Pasteur sometimes calls it, of vaccination, the like of which it may become possible to employ for protection of both men and domestic animals against others of the most intense kinds of virus. The duration of the immunity conferred by inoculation is not yet determined; but during the two years that have passed since it was first proved there have been no indications of its being limited. The preventive treatment adopted by M. Pasteur is based on the foregoing experience; but the determination of the success of the method is far from easy, owing to (1) the difficulty of determining whether the bites were really those of rabid animals; (2) the probability of hydrophobia in persons bitten by dogs that were certainly rabid depending very much on the number and character of the bites, whether they were on exposed parts or parts protected by clothing; and in all cases in the amount of bleeding; (3) in all cases the probability of infection may be affected by speedy cauterizing or excision of the wounded parts, or by various washings, or other methods of treatment; (4) the unequal danger of bites of different species of animals, and even of different dogs. In some groups of cases the percentage of deaths among persons bitten by dogs believed to have been rabid has been estimated at only five per cent., in others at sixty per cent.; and the mortality from the bites of rabid wolves has been variously estimated at from thirty-five to ninety per cent.

By the courtesy of M. Pasteur the committee were enabled to personally investigate ninety cases treated by him, these being mostly those which had been earliest treated, in which the periods since inoculation were longest, and living within reach in Paris, Lyons, and St. Etienne. Among the ninety cases there were twenty-four in which the patients were bitten on naked parts by undoubtedly rabid dogs, and the wounds were not cauterized or treated in any way likely to have prevented the action of the virus; there were thirty-one in which there was no clear evidence that the dog was rabid; others in which the bite had been inflicted through clothes. It is estimated, from experience of the results of bites in other cases, that had they not been inoculated, not less than eight among these ninety persons would have died. Not one of them has shown since the inoculation any signs of hydrophobia.

Since, in order to quiet fears, M. Pasteur has been obliged to inoculate many in whom there was no satisfactory evidence that the bite was that of a rabid animal, it might be unjust to estimate the total value of his treatment in the whole of his cases as being more than the rate of mortality observed in them compared with the lowest rate observed in any large number of cases not inoculated. This lowest rate may be taken at five per cent.; and, as between October, 1885, and the end of December, 1886, M. Pasteur in-

oculated two thousand six hundred and eighty-two persons (including one hundred and twenty-seven from this country), the mortality should have been one hundred and thirty. But at the end of 1886 the number of deaths was thirty-one, including seven bitten by wolves, in whom the symptoms of hydrophobia appeared while they were under treatment; in fact, the actual percentage mortality was between 1 and 1.2, showing, on the lowest estimate, the saving of not less than one hundred lives. Of two hundred and thirty-three persons bitten by animals in which rabies was proved, only four died. Without inoculation at least forty would have died. Among one hundred and eighty-six bitten on the head or face by animals in which rabies was proved, only nine died, instead of at least forty. Of forty-eight bitten by rabid wolves, only nine died, instead of nearly thirty. Between the end of last December and the end of March, M. Pasteur inoculated five hundred and nine persons bitten by animals proved to have been rabid; only two have died, one of these, bitten by a wolf a month before inoculation, dying after only three days' treatment. The committee think it, therefore, certain that the inoculations practised by M. Pasteur have prevented the occurrence of hydrophobia in a large proportion of those who, if they had not been so inoculated, would have died of that disease. And his discovery shows that it may become possible to arrest by inoculation, even after infection, other diseases besides hydrophobia. His researches have also added very largely to the knowledge of the pathology of hydrophobia, and supplied a sure means of determining whether an animal which has died under suspicion of rabies was really affected with that disease or not.

The question whether the method itself entails risk to health or life is then discussed, the distinction between the ordinary method and the "intensive" method being pointed out. By the first method there is no evidence or probability of any danger to health at all; but after the intensive method, which is only practised in the most urgent cases, deaths have occurred which might possibly be attributed to the inoculations rather than to the original infection. Yet in the worst cases the intensive method is relatively more efficacious than the ordinary method, nor is the rate of mortality greater after the former method than after the latter. Certain cases, one of which is detailed, have, however, excited suspicion from the mode of death. The case related is that of a man bitten by a rabid cat at the Brown Institution, treated by M. Pasteur the next day by the intensive method, continued during twenty-four days, and dying about a month later with symptoms of acute ascending paralysis. The man was very intemperate, and had been exposed to chill while crossing the Channel on his return home. Mr. Horsley proved that his death was due to the virus of rabies, by using a portion of his spinal cord for the inoculation of rabbits and dogs, who died with characteristic signs of paralytic rabies, such as usually occurs in rabbits. Yet it is by no means certain that the fatal issue in this and in other cases treated by the intensive method was not due to the original infection. M. Pasteur has, however, greatly modified this plan of treatment, which he employs in none but the most urgent cases.

The final paragraphs of the report, which embody practical suggestions, may be given *in extenso:*

The consideration of the whole subject has naturally raised the question whether rabies and hydrophobia can be prevented in this country. If the protection by inoculation should prove permanent, the disease might be suppressed by thus inoculating all dogs; but it is not probable that such inoculation would be voluntarily adopted by all owners of dogs, or could be enforced on them. Police regulations would suffice if they could be rigidly enforced. But to make them effective it would be necessary (1) that they should order the destruction, under certain conditions, of all dogs having no owners and wandering in either town or country; (2) that the keeping of useless dogs should be discouraged by taxation or other means; (3) that the bringing of dogs from countries in which rabies is prevalent should be forbidden or subject to quarantine; (4) that in districts or countries in which rabies is prevalent the use of muzzles should be compulsory, and dogs out of doors, if not muzzled or led, should be taken by the police as "suspected." An exception might be made for sheep dogs and others while actually engaged in the purposes for which they are kept. There are examples sufficient to prove that by these or similar regulations rabies, and consequently hydrophobia, would be in this country "stamped out," or reduced to an amount very far less than has hitherto been known. If it be not thus reduced, it may be deemed certain that a large number of persons will, every year, require treatment by the method of M. Pasteur. The average annual number of deaths from hydrophobia

during the ten years ending 1885 was, in all England, 43; in London alone, 8.5. If, as in the estimates used for judging the utility of that method of treatment, these numbers are taken as representing only five per cent. of the persons bitten, the preventive treatment will be required for eight hundred and sixty persons in all England; for one hundred and seventy in London alone. For it will not be possible to say which among the whole number bitten are not in danger of hydrophobia, and the methods of prevention by cautery, excision, or other treatment cannot be depended upon.

The editorial comments of the *Lancet* on this report are as follows:

The report of the Hydrophobia Committee has appeared at last, and, it must be confessed, its character supplies a sufficient reason for the delay that has occurred in its production. To consider the evidence that has been accumulated at the Pasteur Institute, and to form an opinion as to the alleged results, could not, indeed, have needed so long a time as a whole year; but to verify those results by independent investigation, to test the practical value of the inoculations as a means of preventing hydrophobia, must, it is evident, require a considerable time; and the Committee is to be congratulated on having attained a definite conclusion in the time they have taken.

The definite character of the conclusion reached will probably render the report a surprise to most members of the profession who have compared the divergent opinions that have been so freely expressed by men not ill qualified to judge, and have duly realized the difficulty of the investigation and the many sources of fallacy arising from the character of the facts themselves. It is certainly satisfactory that men so well able to weigh the evidence and to observe the facts, after having had the fullest opportunity of investigating the results obtained at the Pasteur Institute, should have come with one accord to an opinion so precise. Without doubt their verdict is the most important yet pronounced upon the subject, and must go far to decide the question of the prophylactic value of the inoculations of Pasteur.

The process itself was studied in Paris by three members of the Committee,—Sir Henry Roscoe, Dr. Burdon Sanderson, and Dr. Lauder Brunton. A series of experiments were instituted after the return of these members by Professor Victor Horsley, while the other members of the Committee, Sir James Paget, Sir Joseph Lister, Dr. Quain, and Dr. Fleming, formed an opinion on the facts submitted to them. Those facts are fully stated in an appendix to the report, so that it will be possible for all persons who are interested in the subject to weigh the evidence and the conclusions. It can hardly be doubted that those who are competent to form an opinion will agree in the main with that expressed by the members of the Committee.

It must not be assumed that all parts of the report are of equal value. We have alluded to the sources of fallacy that lurk in the statistics of Pasteur; the members of the Committee have taken due account of them, and have endeavored as far as possible to avoid them. To eliminate them altogether is impossible, and the conclusions reached cannot have more than a very high degree of probability. But it is otherwise with the experiments instituted by the Committee: these are apparently free from all sources of error. They are not numerous, it is true, but their results are unequivocal, and seem to leave no room for doubt that the inoculation with the weakened virus of rabies confers an immunity from the disease. The inoculation with emulsion of the spinal cord of rabid rabbits preserved a series of dogs from rabies, although the most certain conceivable method of inoculation was employed,—a bite from an animal in the acute stage of the disorder. In no case did the animal contract rabies, whereas of other unprotected animals bitten at the same time the majority contracted the disease. The experiments thus seem to leave no doubt of the efficiency of inoculation in rendering harmless a subsequent infection. They prove that the malady, as produced by the attenuated virus, is trifling, and they thus confirm two of the most important statements of Pasteur. On the question whether inoculations, made after a bite has been inflicted by a rabid animal, confer the same immunity,—a question of paramount importance,—the original researches throw no direct light. But the confirmation of the conclusions of Pasteur, in so far as they have been reinvestigated, is not without its significance, for it naturally increases the readiness to accept also those conclusions that have not been the subject of independent study. The statistics of Pasteur have been subjected to a careful examination by the Committee, and the conclusion from the analysis is entirely in favor of Pasteur's method. A considerable number of cases were personally investigated, so far as inves-

tigation was possible after the lapse of a considerable time. The facts of these cases, the means employed to prevent infection,—washing, cauterization, etc.,—and the evidence as to the condition of the dog which bit the patients, are described in the appendix to the report. The conclusion drawn from these facts is that in many of the cases the dog was unquestionably rabid, and that a certain proportion of the sufferers would have died from hydrophobia if they had not been treated, and who, being treated, have not suffered from the disease. The conclusion that the method has saved a considerable number of lives, and that it is at present, and probably will be for long, the only mode of saving from death those who have been bitten by a rabid dog, affords strong support to Pasteur's conclusions, and, we need hardly say, must have most important practical results.

Nor is this all. By the opponents of Pasteur it has been alleged that the dangers of his inoculation are scarcely less than those of the bites of rabid animals. It has been stated that many deaths have occurred in consequence of the treatment, and that some of the patients have actually been affected with paralytic rabies in consequence of the inoculations. On this point also the verdict is in favor of Pasteur. It is, perhaps, doubtful whether this verdict rests on so firm a foundation as does that of the protective power of the treatment. The report confines itself to one of the cases of death after the treatment,—the case of the man Goffi, who was bitten at the Brown Institute, and died in St. Thomas's Hospital. On this case the report throws a new and startling light. It will be remembered that the cause of death was spinal paralysis, and its connection with rabies was denied. Mr. Horsley proves that the disease was paralytic rabies; the results of inoculations make the fact unquestionable. The treatment was certainly unsuccessful, and it is suggested that almost continuous intoxication may have prevented its success. Was the malady due to the original infection or to the "preventive treatment"? The Committee suggest the former as the probable cause, that paralytic rabies may be more common than is supposed, and that the disease known as acute ascending paralysis, or Landry's paralysis, may be, often at least, paralytic rabies. If this conclusion be correct, it is strange that paralytic rabies should not be observed more frequently as the distinct sequel to the known bite of a rabid animal. It seems more probable that, if the death of Goffi was the result of the bites he received, the form of the malady was determined by the influence of the inoculations. But the conclusion of the Committee seems to be that, although the strong virus formerly employed may have entailed some evil consequences, the method now employed is free from serious danger.

We have said that the report of the Committee can hardly fail to have important practical results. The government has ordered the inquiry in response to a public demand, and, the verdict being so clear and strong, the establishment of a Pasteur institution in this country seems now to be their clear duty. Whatever other effect the report may have, it will certainly compel increasing numbers of persons who have been bitten by dogs, rabid or not rabid, to seek what is said to be a certain safeguard against a terrible possibility. That they should have to go to a foreign country for the treatment which the Government Committee consider some at least of the bitten persons will require, will be intolerable. The inevitable result of the report must surely be the establishment of a Pasteur Institute in this country, and, after such an answer as the government has received to its inquiries, the task can scarcely be left to private benevolence.

A CASE OF POISONING FROM CONIINE.

SCHULZ reports in the *Deutsche-Medizinische Wochenschrift* for June 9, 1887, the following case.

It is the custom of Professor Schulz during his lectures on materia medica to circulate among his hearers samples of the drugs lectured upon for inspection. The alkaloid coniine was so arranged that the characteristic odor was plainly perceptible to those who examined it. Although this custom had been observed for some time, no accident had occurred. On one occasion, however, after coniine had been exhibited, the lecturer was informed that a student had been poisoned by inhaling the exhalation of the drug. He proceeded at once to his lodging, and found the case as follows:

The patient, 22 years old, and strong and healthy, had, on the day previous, smelled of the coniine repeatedly, as he had a nasal catarrh, which made it difficult for him to obtain the odor. He noticed, on going to his lodging after the lecture, that the odor seemed to be still present. He was taken with a progressive enfeeblement of his limbs; he could

not keep his eyes open ; he had a painful sensation of burning about the conjunctivæ, and was finally compelled to lie down. The prostration increased, and power over the extremities was lost, although the sensorium was uninfluenced. Severe headache and strong pulsation in the temporal regions ensued. When found by an acquaintance and put to bed, some two hours after the patient noticed the first symptoms, he was almost speechless, the words being spoken very slowly and with great effort. After he was placed in bed a diffused sensation of heat was experienced, and those who were with him supposed fever to be present. This was followed by free perspiration and also profuse secretion of tears. The patient could not rest during the night. Confusion of ideas, images formed from surrounding objects, and utter failure of connected thought were observed. On the following morning the patient's condition was ameliorated : headache and prostration continued, but were less severe. The slightest motion, however, occasioned a profuse perspiration. The nasal catarrh, which the patient had before he was poisoned, had disappeared.

When seen by Schulz, twenty-four hours after he was poisoned, the patient presented no abnormal appearance. He gave a clear account of all which had happened, but complained of headache. Pulse full and soft, 88 ; temperature 98.7°. When he changed his position in bed the perspiration appeared in profusion upon the head, buttocks, and extremities. Constipation and loss of appetite for food and tobacco were present. The following night a normal rest was obtained, and the patient speedily recovered without treatment.

In the literature of the subject Pöhlmann has described the headache and supra-orbital pain following the giving of conium. Schroff and his pupils observed the diaphoretic action of the drug, and endeavored to define the production and limits of this effect. The general symptoms, the paralysis of the muscles about the eyes, the failure of speech and effect upon the circulation are typical of the action of the poison as described by Plato in his description of Socrates's death.

For a full account of cases of poisoning by this drug the reader is referred to Schulz's article on "Coniin" in Eulenberg's Encyclopædia.

UNCOOKED FOOD IN SUMMER DIET.

The discovery of animal alkaloids, their general recognition as a factor in the phenomena of health and disease, may perhaps induce many practitioners to reconsider their opinions with regard to fruit diet. No reasonable amount of fruit, if eaten when ripe and during proper seasons, will induce diarrhœa in healthy subjects. Many erroneously attribute summer dysentery or persistent diarrhœa to excessive indulgence in fruit. This doctrine we have always held to be an exaggeration. To the over-abused stomach, indeed, fruit may possibly prove inconvenient, for the digestive system may be so far impaired as to assimilate only with the greatest difficulty the most natural and wholesome of foods. With children, and robust and healthy people generally, however, this does not apply, and a fruit diet, so far from being noxious, will, on the contrary, prove highly beneficial. Its cooling and antiscorbutic properties are eminently calculated to purify the blood, cleanse the tongue, palate, and stomach, cause gentle and regular laxation, and, as a necessary corollary, induce a clear and fresh complexion. A person who indulges in fruit diet during summer will rarely feel that oppressive heaviness after meals, which is so commonly complained of, or be inconvenienced by heat-rash. Meat necessarily contains a certain amount of ptomaines, the proportion of which increases during the hot months somewhat alarmingly, and it therefore really becomes an inappropriate food in summer. This applies even to those who are obliged to lead an active life. A heavy meal of animal food conduces to oppression, excessive heat, slow and irregular digestion, accumulation of ptomaines, and consequently induces over-production of the highly deleterious leucomaines. It would be well for practitioners to consider whether many of their patients should not be subjected to a new dietetic regimen during the hot months. We would recommend a liberal amount of fruit either directly before or at breakfast, banishing from the table the customary bacon and salt or cured fish. From the mid-day meal of people who dine late we would eliminate entirely every particle of flesh, and substitute either a diet solely composed of uncooked fruit and dry bread, brown or whole meal being preferable, or fruit and farinaceous puddings with milk. Great numbers of people, invalids and strong, active workers alike, would find such a change improve their health materially and increase their enjoyment of life to an extent

of which they can hardly conceive without a trial.

Fruit is of great medicinal value, for the free acid contained in it (in the case of the strawberry and gooseberry about one and a half per cent., in that of the raspberry and currant rather more), besides being an effective antiscorbutic, acts as a calcareous dissolvent. Free fruit diet, if persevered in more generally, would mean less gout, less gravel, less urinary calculi, and other more or less kindred diseases. In most cases an orange or lemon would be a far better "eye-opener" than the matutinal cup of tea or somewhat bilious rum and milk which certain of the public so delight in.

With regard to children, we consider that an unlimited diet of fruit would do no harm, always provided it was indulged in during the day, and not after a heavy meat meal, or late at night. Strawberries, gooseberries, plums, cherries, etc., are not only nourishing, but their use does away with the oppressive feeling so often suffered by children after meals, keeps them cool, and out of mischief. Almost invariably, when we trace inconvenience from fruit-eating in children, we find that the feast has been a clandestine one, and the distressing symptoms are probably due to over-indulgence in unripe or hot fruit. Proper supervision in the distribution of fruit to the juveniles is all that is required. Fruit should be ripe and cool; hot from the rays of the sun, it becomes less indigestible and more likely to do harm, often inducing more or less acute febrile symptoms, together with evidence of gastric disturbance. With the evident danger of alkaloid-poisoning before us, in this age when we rightly consider prevention better than cure, the profession should turn their attention more earnestly to the question of fruit diet, independently of the "grape-" or other "fruit-cure," the vaunted efficacy of which some are not unnaturally unwilling to credit.—*Medical Press*, July 13, 1887.

PROGRAMME OF THE INTERNATIONAL MEDICAL CONGRESS.

The Chairman of the Committee of Arrangements announces the following programme:

First Day—Monday, September 5.—The Congress will assemble at Albaugh's Opera-House at 11 A.M., and will be formally opened by the President of the United States, to be followed by a short address of welcome by the Secretary of State; address by the President of the Congress; report of Secretary-General and Chairman of Committee of Arrangements. Adjourn at 1.30 P.M. From 3 to 6 P.M., meeting of the sections at their respective halls. Evening *conversazione* at U. S. Pension Hall from 8 to 11 P.M.

Second Day—Tuesday, September 6.—Meeting at 10 A.M. at Albaugh's Opera-House. General addresses by Drs. Flint and Semmola. Sections will meet at 11 A.M., and adjourn at the same hour with Congress at 1 P.M. In the afternoon the sections will meet from 3 to 6 P.M. In the evening it is expected that a reception will be given by the President of the United States, and the Corcoran Art-Gallery will be thrown open to the members and their families.

Third Day—Wednesday, September 7.—The Congress will meet at 10 A.M. General addresses until 1 P.M. The sections will meet as usual at 11 A.M., and adjourn at 1 P.M. Afternoon meeting of the sections from 3 to 6 P.M. Evening reception to the members and their families by the citizens of Washington.

Fourth Day—Thursday, September 8.—General meeting at 10 A.M. Addresses, if not previously delivered. Meeting of the sections at 11 A.M.; adjourn at 1 P.M. Afternoon, sections meet from 3 to 6 P.M. General reception buffet banquet at U. S. Pension Hall from 8 to 11 P.M.

Fifth Day—Friday, September 9.—General meeting at 10 A.M. Transaction of business affairs of Congress. Meeting of sections at 11 A.M., and adjourn at 1 P.M. Afternoon, sections meet from 3 to 6 P.M.

Sixth Day—Saturday, September 10.—General meeting at 10 A.M. Adjourn at 11 for visit to Mount Vernon.

On Sunday or Monday, the day not yet determined upon, an excursion train will leave Washington with the foreign members and their families for Niagara Falls, under the escort of a part of the Committee of Arrangements, selecting the route which will afford our foreign brethren an opportunity to see some of the most interesting and thrifty portions of our country, as well as very beautiful scenery.

In completing the details of this programme it may be necessary to make some slight modifications.

SUMMER DRINKS.

A continuance of fine weather and of warm sunshine, in spite of the rain upon St. Swithin's day, and occasionally since, implies a continuance of thirst as a necessary consequence of the free perspiration which is likely to attend all muscular movement. In England tropical heat is so rare that we cannot afford to dislocate all business engagements during the middle of the day, and we suffer accordingly; our ceaseless activity is followed by copious perspiration; this in turn by rapid evaporation and its ordinary risks; then, owing to the enormous drain of water from the system by the skin, the various secretions, more particularly those of the mucous and salivary glands, are diminished, and dryness of the mouth and thirst result. There is naturally great temptation to slake thirst whenever practicable, and to re-establish the balance of fluid in circulation. How this can best be effected becomes, therefore, a question of great importance at the present season. Many persons doubtless increase their discomfort by injudiciously drinking quantities of cold water, which serve to stimulate the sweat-glands, and so to increase the amount of loss by perspiration. While the "cold-water-cure" is to be deprecated, it should not be forgotten that it is equally, if not more foolish, to indulge freely in alcoholic stimulants. For the time they certainly allay thirst by stimulating the salivary glands, but after absorption they promote relaxation of the arterioles and increase the rapidity of the heart's action, and are hence followed by a speedy "Nemesis." The cooling influence of acids should be remembered in times of high temperature. The acid employed will necessarily be largely a matter of taste. Most persons would shrink from the use of dilute solutions of citric or tartaric acid, and yet many find relief from a beverage composed of diluted and unsweetened lemon juice. Should cider be found to agree with the digestion, a very pleasant summer drink may be compounded of equal parts of cider and of any pure form of effervescing water, the Hereford or rough cider being, as a rule, more palatable than the sweetened forms. Cold tea has many adherents, but it is worth noting that it should be poured out while still hot, and not allowed to stand to cool in contact with the leaves, since under these conditions the astringent properties become more completely dissolved, and the tea becomes less palatable and more likely to disorder digestion. Tea has, however, its disadvantages, the chief undoubtedly being the amount of wakefulness produced by it when taken late at night. With regard to iced drinks, it should be borne in mind that the refreshing sense of coolness resulting from their employment in bulk is speedily followed by reaction. This is less felt when a cardiac tonic is employed in this form,—as, for example, the iced coffee so commonly provided at afternoon parties. "American drinks," also, are to be employed only in great moderation and with caution, being liable to induce catarrh of the stomach during the period of reaction following the primary chill. Of the so-called "temperance drinks" and of the more common lemonade and ginger-beer there is little to be said, provided that the purity of their source can be insured; it is, indeed, on this account that we would urge the employment of the more troublesome but infinitely safer home-made lemonade, prepared with boiling water, and rendered more agreeable by the subsequent addition of any pure effervescing water. Sugar should not be added in any quantity, as it evolves so much heat during oxidation. It is curious to note that the French, who, in hot weather, so carefully and wisely avoid alcohol, overlook this influence of sugar, and indulge freely in summer drinks of syrups and *eau sucrée*.—*The Lancet*, July 23, 1887.

THE DETECTION OF MORPHINE-TAKING.

Dr. Oscar Jennings recommends, in cases of suspected morphinomania, the examination of the urine for morphine or opium salts. He recommends the two following reagents:

First.—The double iodide of mercury and potassium (HgCl 13.546, KI 49.80, to a quart of water). This reagent gives a yellowish white precipitate with opium alkaloids.

Second.—The iodized iodide of potassium (I 10 parts, KI 20 parts, to 500 parts of water). With morphine salts this reagent gives a brown or yellowish precipitate.

If the quantity be too small to discover by one of these reagents, boil the urine to a third, treat with tartaric acid; then dissolve the tartrate of morphine thus formed with amylic alcohol; decompose the salt with ammonia, and if morphine be present, the solution should show a blue color on adding the perchloride of iron. A slightly less troublesome proceeding will detect meconic acid and prove the taking of opium; evaporate, wash with alcohol and boiling water, neutralize with magnesium carbonate, and treat, after filtration, with solution of iron perchloride. A blood-red color is characteristic of meconic acid.

MERCURIAL INJECTIONS.

A discussion has recently been taking place in the Brussels Medical and Scientific Society as to the relative advantages of mercurial injections and inunctions combined with internal medication. Dr. Thiry prefers the latter method, as he thinks injections are attended with serious risks and inconveniences. M. Ed. de Smeth, on the other hand, practises injections largely—in fact, always—when mercury is indicated in syphilitic patients. At present there are in his wards twenty-four such cases in which no less than nine hundred injections have been given without any accident occurring; and M. de Smeth thinks that as, apart from his own practice, M. Martineau has reported a series of one hundred and eighty thousand injections without any accident, Lewin three hundred thousand with twenty abscesses, and Paikert five thousand without any, it cannot be said that this form of treatment is more liable to inconveniences than other forms. He points out that there is a great difference between injecting insoluble salts, as calomel and the yellow oxide, in the way recommended by Scarienzo, upon which method M. Thiry's experience of injections was mainly gained, and injecting soluble salts, which is the plan he himself prefers and follows. Here, he says, the only objection to the injections is that the patient must be regularly seen by the doctor, which in private practice is sometimes inconvenient. Of course care must be taken that the syringe is perfectly clean and that the liquid is well filtered. In order to illustrate the occasional importance of the rapid action which can only be obtained by the method of injecting soluble salts of mercury, M. de Smeth mentions a case of syphilitic laryngitis of so urgent a character that it was thought that laryngotomy would be needed. However, by means of hypodermic injections repeated five or six times during the course of twenty-four hours all danger was averted.—*The Lancet*, June 25, 1887.

DISCOVERY OF DIAMIDE.

A very interesting discovery has just come to us from Germany. The author, Theodor Curtius, investigating diazoacetate of ethyl, found that by the action of potash a yellow crystalline compound was obtained, which, in its turn, was changed by sulphuric acid into white crystals, which proved to be the sulphate of the long-sought base diamide N_2H_4. The important compounds called amides and amines contain, as is well known, the radical NH_2, formerly known as amidogen, which is the true analogue of hydroxyl, OH, and cyanogen, CN. This radical has at last been isolated, but, as in the case of the other normal radicals, the formula must be doubled, and the free compound is N_2H_4 or $NH_2.NH_2$. The base is easily obtained from its sulphate by the action of alkalies, and is a very interesting substance, about which we shall soon know more. It is a gas soluble in water, and fuming with hydrochloric acid. Its solution is a base, and turns red litmus to blue, and yet it is in smell and in other respects different from ammonia. It is a powerful reducing agent, readily reducing Fehling's solution and nitrate of silver. Its salts are suddenly decomposed by heat, and yield nitrogen when treated with nitrous acid, which last reaction shows their true amidic nature. The further study of this most interesting substance will be awaited eagerly by all chemists.—*The Lancet*, July 2, 1887.

A CONVENIENT FORMULA FOR NAPHTHALIN.

Bouchard suggests the following:

℞ Naphthalin, gr. lxxv;
Sacchar, gr. lxxv;
Essent. bergamot, gtt. ii.
Div. in chart. 20 in num.
Sig.—One powder every hour.

The drug may also be placed in gluten-capsules, each of which contains four grains.

The drug is an excellent antiseptic. It is generally very well borne, and may be given in quantities as great as from 50 to 75 grains daily. It has no effect upon the circulation, but is simply an intestinal antifermentative and germicide.—*Archives de Pharmacie*, No. 6, 1887.

OXALIC ACID IN ASTHMA.

Although a dangerous poison, oxalic acid seems to have proved very beneficial in the treatment of ten cases of asthma by Dr. V. Paulet. He calls attention to the difference of action when the drug is given in a concentrated and when it is given in a diluted form. When administering the drug it is necessary to bear in mind the following considerations: 1. The dose should be in proportion to the weight of the body; 2. Time of administration; 3. The state of health or of the disease of the subject; 4. The idiosyncrasy of the patient.—*National Druggist*, July 1, 1887.